QH
1
N314X
NH

THE MARYLAND NATURALIST

Volume 44, Number 2 Winter 2001

Contents

Atlas and Annotated List of *Carex* (Cyperaceae) of Maryland and the District of Columbia.....
Christopher T. Frye and Christopher Lea 41

Instructions to Authors..... 110

SMITHSONIAN
DEC 13 2002
LIBRARIES

Founded in 1929

A Biannual Publication of the Natural History Society of Maryland

The Maryland Naturalist

A Biannual Publication of the Natural History Society of Maryland

Managing Editor
Joel W. Snodgrass
The Maryland Naturalist
Department of Biological Sciences
Towson University
Towson, MD 21252, USA

Copy Editor
Joe McSharry

Graphics & Typsetting
Holli Friedland

The Maryland Naturalist is a peer-reviewed, biannual publication of the Natural History Society of Maryland, Inc., a 501(c)(3) scientific and educational non-profit organization. Funding for publication is provided by membership dues. Membership in the Society is open to all individuals or institutions interested in natural history. Dues are paid annually and are as follows: individual - $25.00; family - $35.00; contributing - $65.00; sustaining - $120.00; life - $750.00; institutional - $50.00. Contact information can be found at the bottom of this page.

The Maryland Naturalist seeks to publish original research concerning the natural history and ecology of Maryland and adjacent states. Full-length manuscripts may deal with subject matter including the geology, chemistry, and biology of the Maryland region. Short communications should describe unusual observations. Instructions for preparation of manuscripts can be found in the back of this journal.

Board of Trustees

Chairman of the Board: Charles A. Davis

Patricia Cornman
Timothy Eldredge Hoen
Joseph McSharry
D. Earl Redman
William F. Seip
Donald R. Windler

Officers for 2001

President: Joseph McSharry
Vice President: D. Earl Redman
Treasurer: Donald R. Windler
Secretary: Patricia Cornman

Published by the Natural History Society of Maryland, Inc.
2643 North Charles Street
Baltimore, MD 21218-4590, USA
410-235-6116
www.naturalhistory.org

Printed by Cadmus Journal Services
Linthicum, MD 21090, USA

Atlas and Annotated List of *Carex* (Cyperaceae) of Maryland and the District of Columbia

Christopher T. Frye[1] and Christopher Lea[2,3]

[1]*Maryland Department of Natural Resources, Wildlife and Heritage Service, Tawes State Office Building, E-1, 580 Taylor Ave., Annapolis, MD 21401*

[2]*National Park Service, 7206 National Seashore Lane, Berlin, MD 21811*

Abstract.—Collections and field research were conducted to document the entire flora of the genus *Carex* (Cyperaceae) in Maryland and the District of Columbia as a county-based state atlas and annotated list. One hundred seventy-five taxa, representing 158 species, are reported. Twenty-nine of these taxa are newly reported for the area since publication of the current Maryland flora, with eight of the new taxa first identified by this study. Ten taxa previously reported by other authors are excluded based on erroneous or unfounded sources. The history of floristic research on the genus in the area is reviewed, and phytogeographic patterns are examined. County occurrence maps and an annotated checklist of the taxa, with notes on key identification features, distribution, habitat, and rarity, are presented.

Introduction

Carex (Cyperaceae) is the largest genus of vascular plants in most areas of eastern North America (e.g., Harvill 1973; Reznicek and Ball 1974; Wheeler and Ownbey 1984; Reznicek 1989). It is often not well understood in floristic studies because of its complexity and the identification challenges presented by many taxa (Reznicek 1989). A number of discoveries in Maryland and the District of Columbia have been made since Brown and Brown (1984) documented Maryland's flora. Additionally, the past two decades have seen a number of new taxonomic treatments of North American *Carex* (see Literature Cited section), which, in total, represent a significant revision of those employed by a number of state and regional floras currently in use. Together, these situations create the need for an updated treatment and phytogeographic study of the genus in Maryland and the District of Columbia.

History of the Study of Carex in Maryland and the District of Columbia

Any effort of this scope rests upon the foundation laid by many previous generations of botanists and taxonomists, and we begin with a summary of historical context of the study of *Carex* in our area. Collections of Maryland and District of Columbia *Carex* on which most current floristic knowledge is based were begun in the 1870s. Theodor Holm, Forrest Shreve, Howard Shriver, John Donnell Smith, Edward C. Steele, George Vasey and Lester Ward are prominent among collectors of *Carex* in Maryland and the District of Columbia in the late 19th century and the earliest years of the 20th century. Ward (1881) published a flora of Washington, DC and vicinity, defined approximately as that area within 15 miles of the Capitol (Hitchcock and Standley 1919); he recognized 70

[3]Chris_Lea@nps.gov

taxa within the genus. Ward's work was eventually updated and expanded by Hitchcock and Standley (1919); the latter remains the most recent flora for the District of Columbia. The treatment of *Carex* in Hitchcock and Standley (1919), by G. P. Van Eselstine, lists 95 species represented by specimens, with several infraspecific taxa and hypothetical species also mentioned.

During an ecological survey of the vegetation of Maryland, Shreve et al. (1910) compiled a statewide list of vascular plants. Although the authors acknowledged that the goal of the study was primarily a description of vegetation, rather than a comprehensive floristic effort, their work is believed to be the first list of the vascular flora for the entire state, and included 56 *Carex* taxa.

Significant collecting of *Carex* in Maryland and the District of Columbia continued through the first half of the 20th century. Collectors include Sydney F. Blake, Elizabeth Earle, Frederick J. Hermann, Ellsworth P. Killip, Emery C. Leonard, Bayard Long, William R. Maxon, John Bitting Smith Norton, Hugh O'Neill, Paul C. Standley, Witmer Stone, Robert R. Tatnall, Ivar Tidestrom and Rodney True. During the early part of this period, Kenneth K. Mackenzie, who was associated with the New York Botanical Garden and who eventually published a landmark treatment of North American *Carex* (Mackenzie 1931, 1935), reviewed and annotated many Maryland and District of Columbia collections housed at the Smithsonian Institution. This period culminated with the publication of two checklists (Hermann 1941, 1946) of the flora of the vicinity of the District of Columbia, the definition of which had been expanded from the area covered by Ward (1881) and Hitchcock and Standley (1919) to include virtually all of the Piedmont physiographic province and the Western Shore of the Chesapeake Bay in Maryland (Schmidt 1993). Hermann (1946) reported 123 *Carex* taxa for the expanded vicinity of Washington, DC.

Numbers and collection dates of specimens in herbaria suggest a generally reduced level of field study of *Carex* (and other components of the flora) in Maryland and District of Columbia from the 1940s through the 1970s, as compared to the preceding 70 years. Perhaps the most prolific collector of carices from the late 1950s to the early 1970s was Eduards Baltars, who contributed to much of our understanding of the genus in the state, particularly in the northern Piedmont area. Frederick J. Hermann, a U.S. Department of Agriculture botanist and a prominent caricologist of the time, continued his contributions over a period of over 30 years, primarily through examinations and annotations of countless specimens in collections.

By the early 1980s, two events had served to refocus efforts on collecting floristic data on *Carex* in Maryland. First, in 1979 the Maryland Natural Heritage Program was initiated within the Maryland Department of Natural Resources and began an effort to determine and document the state's rarest vascular plants. Natural Heritage staff and their network of field biologists throughout the state were responsible for greatly expanding our knowledge of the occurrence and distribution of the state's rarest carices. Significant collectors of *Carex* during the 1980s and 1990s are D. Daniel Boone, Charles Davis, Steven R. Hill, Wayne D. Longbottom, William McAvoy, Roderick Simmons, Brent Steury and Edward Thompson. The second event was the publication of the first comprehensive flora for the herbaceous vascular plants in Maryland by Melvin L. Brown and Russell G. Brown (Brown and Brown 1984). They recognized 154 *Carex* taxa

(some of which are indicated as being hypothetical for the state).

Purpose and Development of the Study

Prior to 1997, the Maryland Natural Heritage Program listed 77 *Carex* species as being of conservation concern (i.e., rare, threatened, endangered, watchlist, or status uncertain; Maryland Natural Heritage Program 1994), a total that represented about one-half of the *Carex* taxa known from the state. The reasons for this rather high proportion of listed taxa are several, and are similar to problems affecting the understanding of *Carex* in other areas (e.g., Reznicek 1989). First, a number of taxa had been, and continued to be infrequently collected or under-reported because of identification challenges. Also, compared to recent research, the treatment by Brown and Brown (1984) of some sections of the genus had become outdated, so that taxonomic and nomenclature confusion was contributing to misunderstandings concerning the distribution and conservation statuses of some taxa. The conservation ranks of the 77 listed species were reviewed in 1997, and nearly 60 percent of these subsequently received some level of revision. The majority of changes involved reducing the priority of the conservation rank of species that were found to be more common than formerly believed. For smaller numbers of species, higher priority ranks were assigned in order to reflect evidence of greater rarity than formerly perceived, and the ranks of several other species were changed to reflect uncertainty about their statewide status.

While we initiated our research in 1998, primarily as a collections review in order to further refine Natural Heritage ranks of the rarer taxa in Maryland, this process suggested a substantial need for a revision of the treatment of the entire genus within the state. Here, we present the summary of both our collection reviews and statewide fieldwork from 1998 through 2001 as well as substantiated reports by others. Despite four years of research, much work remains. Some taxa remain taxonomically or floristically problematic, often because of unstable circumscriptions or nomenclature. Others may include local variants and perhaps inter-taxa gradations. Therefore, we welcome updates, corrections or additions (please send to the first author).

Phytogeographical Setting

For purposes of describing *Carex* distribution patterns in this paper, we define five phytogeographic sections of Maryland and the District of Columbia (Figure 1), which are based on physiographic provinces (Schmidt 1993). With the exception of one boundary between two sections, our phytogeographical sections also correspond to the five (vegetation) districts within three floristic zones described by Shreve et al. (1910).

The Allegheny Plateau phytogeographic section (Figure 1) corresponds to the physiographic province of that name as described by Schmidt (1993), and to the Mountain Zone of Shreve et al. (1910). It consists of that part of Maryland west of the Allegheny Front, including all of Garrett County and extreme western Allegany County (Figure 1). Most of this section lies above 610 meters (above 2000 feet) above sea level (ASL). It is comprised of a dissected plateau underlain by sedimentary rocks of late Paleozoic age (Schmidt 1993). Vegetation is transitional between the northern Hemlock-White

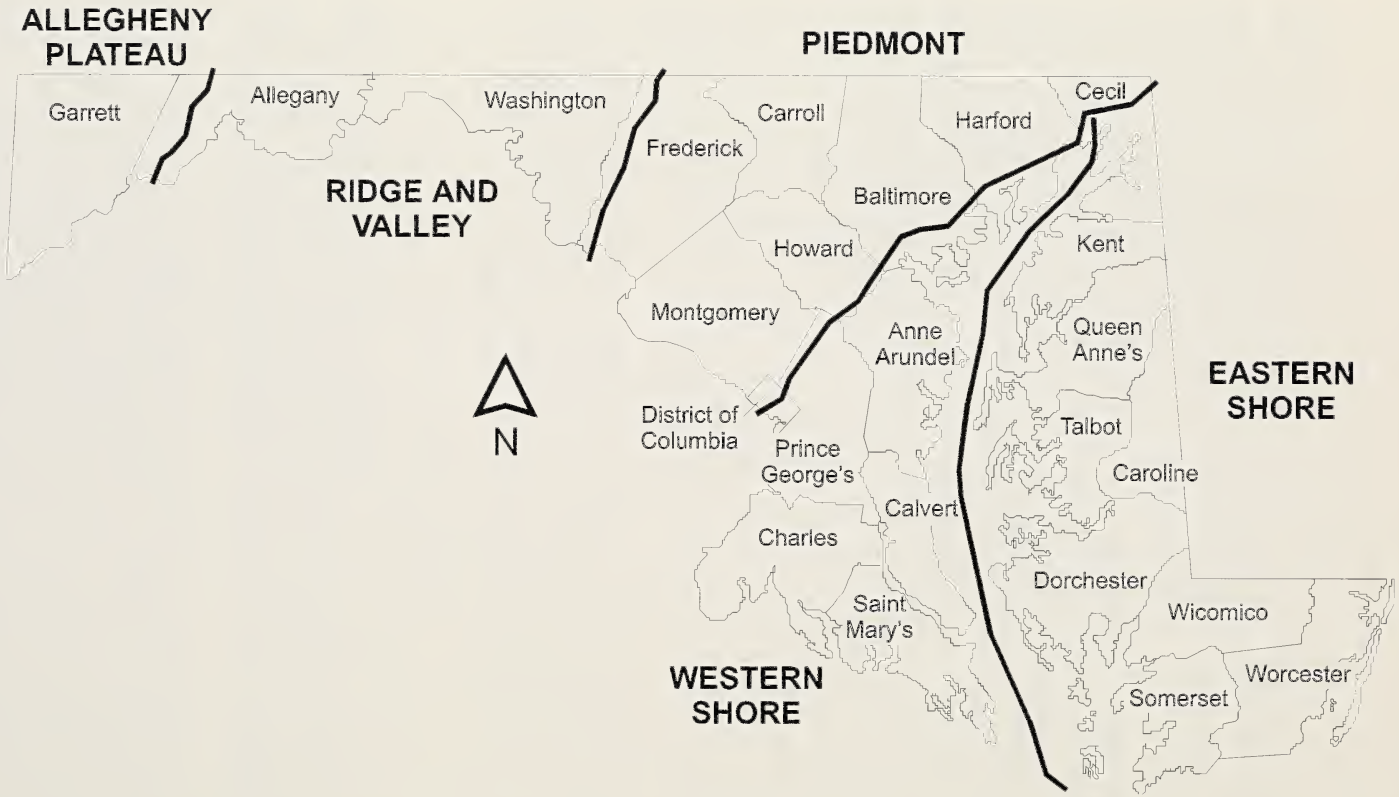


Figure 1. Map of Maryland and the District of Columbia, with counties. Phytogeographic sections are separated by bold lines and labeled in capital letters.

Pine-Northern Hardwoods forest region and the Oak-Chestnut forest region characteristic of much of the Appalachian Mountains (Braun 1950). Accordingly, this section has a number of floristic elements characteristic of glaciated regions to the north of Maryland. It has vegetation formations unique or nearly so within the state, including northern hardwood forest associations and extensive non-tidal peatlands. Of all of the phytogeographic sections in Maryland, it is perhaps the most floristically distinct.

The Ridge and Valley phytogeographic section (Figure 1), as it is used in this paper, includes both the Valley and Ridge, and the Blue Ridge physiographic provinces of Schmidt (1993). In Maryland, this section extends east from the Allegheny Front at the eastern edge of the Allegheny Plateau through the folded Appalachians, which represent the Valley and Ridge physiographic province. The Valley and Ridge province is underlain entirely by sedimentary rocks of Paleozoic age, with resistant strata (primarily sandstones) forming elevated ridges that alternate with valleys occupied by more easily weathered strata composed primarily of shale and limestone (Schmidt 1993). The forest soils of the ridges tend to be somewhat acidic, while carbonate rocks in the valleys produce a more neutral substrate supporting a characteristic flora that includes a number of calciphilic species. Valley floor elevations generally range from 120 to 245 meters ASL, while ridge crests are generally from 365 to 610 m ASL. In addition to the (geologically defined) Valley and Ridge physiographic province of Schmidt (1993), our Ridge and Valley phytogeographic section includes the smaller and floristically similar Blue Ridge physiographic province to the east. The latter province is comprised primarily of resistant metamorphic rocks of early Paleozoic to Precambrian age and is represented in Maryland by South Mountain, the Catoctin Creek valley, and the Catoctin Mountains (Schmidt 1993). The entire Ridge and Valley phytogeographic section includes most of Allegany County, all of Washington County, and western Frederick County. It corresponds to the Upper Midland floristic district of the Midland Zone of Shreve et al. (1910), with the exception of the Frederick (Monocacy) Valley and Parrs Ridge areas (the inner Piedmont). It lies entirely within the Oak-Chestnut forest region of Braun (1950), and is floristically transitional between the Allegheny Plateau and the Piedmont sections, though more similar to the latter.

The Piedmont phytogeographic section (Figure 1) corresponds to the Piedmont physiographic province of Schmidt (1993), and to the entire Lower Midland district and the eastern part of the Upper Midland district of Shreve et al. (1910). It extends from the eastern base of the Catoctin Mountains to the Fall Line to include all of Carroll and Montgomery Counties, nearly all of Howard County, most of Frederick, Baltimore, Harford, and Cecil Counties, extreme northwestern Prince Georges County, and the western parts of the District of Columbia and the city of Baltimore. Elevations generally range from 60 to 245 m ASL, with lower elevations occurring along Fall Line sections of rivers. The Piedmont is the most geologically complex physiographic province in Maryland (Schmidt 1993). The eastern part (the outer Piedmont or Piedmont Plateau) is underlain by resistant metamorphic rocks of Precambrian and early Paleozoic age, while the Frederick Valley to the west (inner Piedmont) is occupied by more easily weathered sedimentary strata of Paleozoic to early Mesozoic (Triassic) age (Schmidt 1993). The Piedmont phytogeographic section also lies entirely within the Oak-Chestnut forest region and is floristically most similar to the Ridge and Valley section. It has considerable localized

habitat diversity created by a variety of bedrock formations, including felsic, mafic, and calcareous types, and by the high gradient reaches of rivers along the Fall Line.

The Western Shore phytogeographic section (Figure 1) includes all of the Coastal Plain physiographic province of Schmidt (1993) that is west of the Chesapeake Bay and the Elk River, and has the Fall Line as its western boundary (Figure 1). It is identical to the Western Shore district of the Coastal Zone of Shreve et al. (1910) and includes all of Anne Arundel, Charles, Calvert, and St. Mary's Counties, nearly all of Prince Georges County, small parts of Howard, Baltimore, Harford, and Cecil Counties, and the eastern parts of the District of Columbia and the city of Baltimore. Elevations range from sea level to less than 60 ASL. This section is underlain by unconsolidated sediments that show a progression from more elevated, older (Cretaceous and Tertiary) formations of modest topographic relief in the western part of the section to uniformly low-lying, younger (Quaternary) sediments adjacent to the Chesapeake Bay and the larger rivers (Schmidt 1993). The Western Shore section is floristically diverse, evidently because it is transitional between the Oak-Chestnut forest region of the Piedmont and the Oak-Pine forest region of the coastal southeastern United States (Braun 1950) and includes flora elements typical of both areas. The latter region is prevalent on the Eastern Shore, but also occupies the lower, younger formations along estuaries on the Western Shore.

The Eastern Shore phytogeographic section (Figure 1) includes all of the Coastal Plain physiographic province of Schmidt (1993) that lies east of the Chesapeake Bay and the Elk River. It is identical to the Eastern Shore district of the Coastal Zone of Shreve et al. (1910). It includes all of Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Somerset, and Worcester Counties and southeastern Cecil County. Elevations are mostly less than 20 m ASL. This section is underlain by relatively young (Tertiary and Quaternary) sediments of uniformly low relief (Schmidt 1993). It is mostly within the Oak-Pine forest region, with the northernmost counties transitional to, or within, the Oak-Chestnut region. Significant Eastern Shore habitat features include extensive fresh and salt tidal marshes, blackwater river swamps, barrier islands, and Delmarva Bays (seasonal ponds).

Methods

From 1998 to 2001, we examined approximately 4800 herbarium specimens held by the following collections: BALT, GMUF, MARY, NA, PH, US (acronyms follow Holmgren et. al. 1990), Anne Arundel Community College (Arnold, Maryland), Assateague Island National Seashore (Berlin, Maryland), Cylburn Gardens and Arboretum (Baltimore, Maryland), Delaware Natural Heritage Program (Smyrna, Delaware), Frostburg State University (Frostburg, Maryland), National Capital Parks East (Washington, DC), U. S. Geological Survey, Water Resources Division (Reston, Virginia), Tawes Herbarium (Department of Natural Resources, Annapolis, Maryland), and several private collections. In the great majority of cases, a specimen examined by one or both of us was used as the basis for a county record. For a small number of cases, we accepted other credible records (e.g., from specimens examined by specialists in the group and reported to us, credible published records of specimens not seen by us, and Natural Heritage sight records of easily identified taxa). Collections containing vouchers used in this study but not examined by us include some at DOV, GH, MICH, NCU, KNK, NY, OS, VPI, and WVA.

Additionally, we devoted approximately 360 person-days during this period to floristic field study of *Carex* in Maryland and the District of Columbia. Although we visited each county of Maryland and the District of Columbia on at least two trips, we specifically allocated portions of our efforts to cover areas that our collection review suggested were historically less well-collected (e.g., several counties on the lower Eastern Shore and in the northern Piedmont). We also directed special effort and attention to taxa that appeared to be poorly represented in collections relative to their probable abundance, often due to cryptic habits, early fruiting phenologies, and/or identification challenges (e.g., Sections *Acrocystis* and *Ovales*). Finally, we also concentrated on groups of taxa that were taxonomically not well known in the area (e.g., Section *Stellulatae*, the *Carex amphibola* complex, and infraspecific taxa).

In the field, we identified individual *Carex* plants, and made notes on the location, habitat, and relative abundance of individual taxa. We collected approximately 3,500 specimens, as needed for more intensive identification work and/or as vouchers. A dissecting microscope (10-60 x) and an ocular micrometer often assisted laboratory examination. Specialists, particularly A. A. Reznicek, provided assistance with some taxonomic determinations. Our collections have been deposited chiefly at the Tawes Herbarium, MARY, MICH, US, DOV, Frostburg State University, and Anne Arundel Community College.

From the collection research and fieldwork, we documented the presence of each taxon verified for Maryland or the District of Columbia for each of its counties of occurrence as a record in a database maintained by the Maryland Department of Natural Resources, Wildlife and Heritage Service. The District of Columbia is treated as a county, while records for the city of Baltimore are included under those for Baltimore County. Each county record includes, minimally, the taxon name, county, date of collection or observation, collector or observer name, collector number, and name of collection repository (if applicable). Details of individual county records may be obtained by contacting the first author.

To describe phytogeographical patterns of the native *Carex* taxa in Maryland, we employed a principle components analysis (PCA) (Gauch 1982; Pielou 1984) of the 160 native taxa in counties space, using binary data in the original data matrix (taxon presence in a county scored as 1; taxon absence scored as 0). The data were centered by the column (county) means. We used PC-Ord v. 3.04 (McCune and Mefford 1997) for calculations.

Results and Discussion

Results Summary

We recognize 158 species and 175 total taxa for Maryland and the District of Columbia (see annotated list). These numbers are the result of the additions of 29 taxa (summarized in Table 1) and deletions of 10 taxa (Table 2) to the total represented by the combined, and taxonomically reconciled, listings of Hitchcock and Standley (1919) and Brown and Brown (1984). Our own fieldwork during this study produced six of the additions (*Carex* species 1, *C. arctata, C. corrugata, C. digitalis* var. *asymmetrica, C. haydenii,* and *C. laxiculmis* var. *copulata*), and new determinations of specimens during our review of existing collections uncovered three other newly reported taxa (*C.*

Table 1. Additions to the *Carex* flora of Maryland and District of Columbia reported by Brown and Brown (1984) and/or Hitchcock and Standley (1919), with remarks. Taxa added from fieldwork of this study are denoted by a single asterisk (*). Taxa added from critical review of herbarium specimens by this study are denoted by a double asterisk (**).

TAXON	REMARKS
Carex acutiformis Ehrhart	First known Maryland collection in 1997.**
Carex aestivaliformis Mackenzie	One known Maryland collection, in 1946.
Carex annectens (Bicknell) Bicknell var. *xanthocarpa* (Kükenthal) Wiegand	Several Maryland collections, as early as 1888; infraspecific taxa for *C. annectens* not recognized by Brown and Brown or by Hitchcock and Standley.
Carex arctata W. Boott	First known Maryland collection in 2001.*
Carex austrina (Small) Mackenzie	First known Maryland collection in 1998.
Carex corrugata Fernald	First known Maryland collection in 1998.*
Carex crinita Lamarck var. *brevicrinis* Fernald	Numerous Maryland collections found; infraspecific taxa for *C. crinita* not recognized by Brown and Brown or by Hitchcock and Standley.
Carex diandra Schrank	First known Maryland collection in 1987.
Carex distans Linnaeus	One known Maryland collection, in 1946.
Carex eburnea F. Boott	First known Maryland collection in 1986.
Carex granularis Muhlenberg *ex* Willdenow var. *haleana* (Olney) Porter	Several Maryland collections, as early as 1873; infraspecific taxa for *C. granularis* not recognized by Brown and Brown or by Hitchcock and Standley.
Carex gravida Bailey var. *lunelliana* (Mackenzie) Hermann	First known Maryland collection in 1997.
Carex haydenii Dewey	First known Maryland collection in 2000.*
Carex species 1	First identified for Maryland from a collection in 2001.* A second collection (1915) subsequently found.
Carex laxiculmis Schweinitz var. *copulata* (Bailey) Fernald	First known Maryland collection in 2000.*
Carex leptonervia (Fernald) Fernald	Brown and Brown listed taxon, but noted no Maryland records; first known Maryland collection in 1981.
Carex lucorum Willdenow *ex* Link var. *lucorum*	Several Maryland collections, as early as 1881; may have been included in concept of *C. pensylvanica* by Brown and Brown.
Carex michauxiana Boeckeler	Brown and Brown listed taxon, but noted no definite Maryland records; first known Maryland collection in 1981.
Carex mitchelliana M. A. Curtis	First known Maryland collection in 1996.
Carex oxylepis Torrey and Hooker var. *oxylepis*	First known Maryland collection in 1997.**
Carex pedunculata Muhlenberg *ex* Willdenow	Brown and Brown listed taxon, but noted no Maryland records; first known Maryland collection in 1987.
Carex planispicata Naczi	Recently described and reported for Maryland and for District of Columbia by Naczi (1999); several collections (as *C. amphibola* or *C. oligocarpa*), as early as 1899.
Carex richardsonii R. Brown	Several Maryland collections, as early as 1951.
Carex stipata Muhlenberg *ex* Willdenow var. *maxima* Chapman	Numerous Maryland collections, as early as 1912; infraspecific taxa for *C. stipata* not recognized by Brown and Brown or by Hitchcock and Standley.
Carex striata Michaux var. *brevis* Bailey	Several Maryland collections, as early as 1983. Listed for Eastern Shore by Tatnall (1946), but not for Maryland by Brown and Brown (1984).
Carex striata Michaux var. *striata*	First known Maryland collection in 1993.**
Carex tonsa (Fernald) Bicknell var. *rugosperma* (Mackenzie) Crins	Several Maryland collections, as early as 1939; illustrated as *C. umbellata* var. *rugosperma* (probably a *nomen nudum*), but not otherwise treated, by Brown and Brown.
Carex tuckermanii F. Boott *ex* Dewey	First known Maryland collection in 1991.

acutiformis, C. oxylepis, and *C. striata* var. *striata*). Other additions were based on collections of previously unreported taxa by other field workers since 1984, on specimens that we found in herbaria that had been collected before 1984 but not reported in either flora, and on confirmed collections of taxa reported as hypothetical by Brown and Brown (1984). All deletions are based on our critical review of herbarium collections and other sources; in some cases, we found no basis for a report of a taxon in the herbarium collections, and in others we found a purported presence of a taxon to be based on a misidentified specimen.

Phytogeographical Patterns of Carices in Maryland and the District of Columbia

Figure 2 depicts a scatter plot (ordination diagram) of the first and second axis scores generated by the PCA for individual native taxa. Phytogeographic affinities of groups of taxa are delineated as we have interpreted them from visual examination of the scatter plot and from supplemental knowledge gained from our field experience. Table 3 lists eigenvector loadings on each of the first two PCA axes generated by each county. While the PCA scatter plot effectively shows general distribution patterns within the

Table 2. *Carex* taxa excluded for Maryland and District of Columbia. Taxa listed were originally reported by Brown and Brown (1984), or by Hitchcock and Standley (1919).

TAXON	REMARKS
Carex alopecoidea Tuckerman	Reported (as hypothetical) by Hitchcock and Standley, based on a report by Holm; a specimen so labeled at US was misidentified.
Carex bicknellii Britton	Reported by Brown and Brown, who noted no Maryland records; no specimens found.
Carex foenea Willdenow	Reported by Brown and Brown; no specimens found; all Maryland collections seen labeled or annotated as *C. foenea* were determined to be *C. argyrantha*, a taxon to which the name *C. foenea* has been misapplied.
Carex intumescens Rudge var. *fernaldii* Bailey	Reported by Brown and Brown; no specimens found.
Carex nigra (Linnaeus) Reichard	Reported (as hypothetical) by Hitchcock and Standley as *C. goodenovii* Gay, based on *C. vulgaris* Fries, as listed by Ward (1881); no specimens found. Most likely a misidentification of, or a name misapplied to, *C. emoryi*.
Carex novae-angliae Schweinitz	Reported by Brown and Brown; specimen at MARY so labeled was misidentified.
Carex retrorsa Schweinitz	Reported by Brown and Brown; no specimens found.
Carex schweinitzii Dewey	Included in Brown and Brown, who noted no definite Maryland records; no specimens found.
Carex tenuiflora Wahlenberg	Reported by Brown and Brown; specimen at MARY so labeled was misidentified.
Carex venusta Dewey var. *venusta*	*C. venusta* reported by Brown and Brown, who noted that most Maryland plants are var. *minor*. All *C. venusta* in Maryland found during this study are var. *minor*.

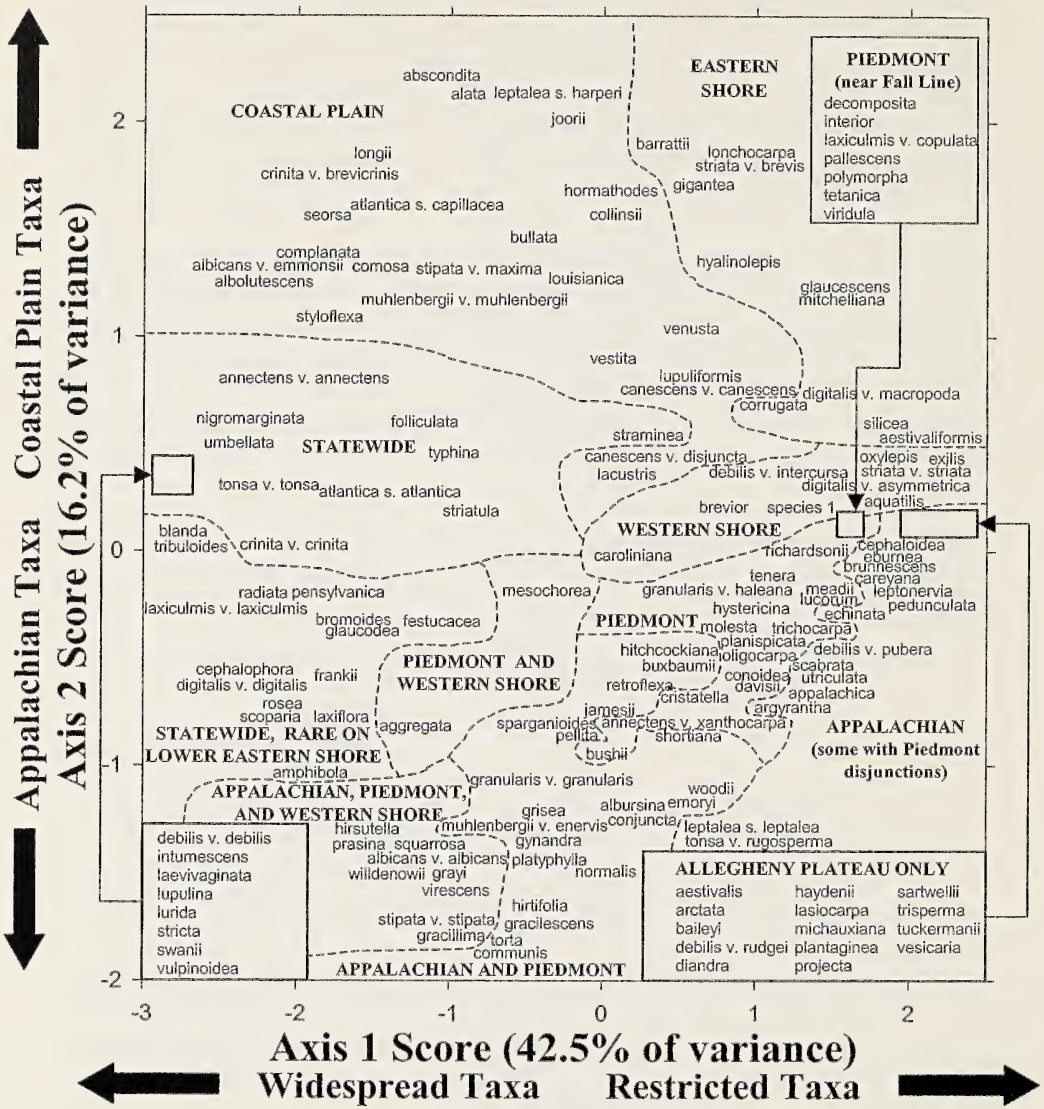


Figure 2. Ordination diagram (scatter plot) showing position of individual native Maryland and District of Columbia *Carex* taxa in counties space as determined by scores on first two PCA axes. Dash lines separate our interpretations of phytogeographically similar groups of taxa (affinities denoted in capitals). Positions of names of some taxa in the scatter plot have been moved minimally from the actual positions occupied by the points representing these taxa for clarity. "Appalachian" refers to the Allegheny Plateau and the Ridge and Valley phytogeographic sections combined. "Coastal Plain" refers to the Eastern Shore and Western Shore phytogeographic sections combined.

entire *Carex* flora, and suggests geographical affinities among taxa, the user of this atlas should rely on individual taxon descriptions and the associated maps as the most accurate representation of distribution for each taxon. The positions of a very few taxa on the scatter plot are "misclassified" with respect to the best phytogeographic interpretation of the groups.

Axis 1 (42.5%) and 2 (16.2%) together accounted for 58.7% of the total variance in the data. Only these axes generated eigenvalues that exceeded their broken-stick eigenvalues, accounted (therefore) for more variation than would be expected by chance (Jackson 1993), and were considered for interpretation. The largest positive (least negative) eigenvector loadings on Axis 1 (Table 3) were produced by counties with fairly distinctive *Carex* flora, including the Allegheny Plateau county of Garrett (particularly) and the lower Eastern Shore counties of Somerset, Wicomico, and Worcester. The largest negative loadings for Axis 1 were represented by those of the central counties, particularly the Western Shore counties of Anne Arundel, Charles, and Prince Georges and the District of Columbia. The taxa groupings along Axis 1 of the PCA scatter plot (Figure 2) show a progression from very restricted and often rare taxa on the right side of the plot to widespread and common taxa on the left side. For Axis 2, the largest positive eigenvector loadings were produced by the southern Eastern Shore counties of Worcester, Wicomico, Dorchester, Caroline, and Somerset, while the counties with the largest negative loadings are those partially or completely within in the Ridge and Valley phytogeographic section, including Washington, Allegany, and Frederick.

The source of the greatest phytogeographical variation in Maryland's *Carex* flora detected by the PCA (represented primarily by Axis 1) is the degree of distinctiveness of the local (county-level) flora. The relative specialties of the Allegheny Plateau and the lower Eastern Shore produce a contrast with the widespread taxa in the flora of the Western Shore and, to a lesser degree, the Piedmont and the upper (northern) Eastern Shore. A second important source of floristic variation (represented primarily by Axis 2) is the gradient of elements characteristic of the Coastal Plain in the eastern part of the state to montane elements in the western areas. We note that much of the variance accounted for by Axis 1 might be considered trivial for phytogeographical interpretation. While phytogeographers generally assign greater significance to taxa co-occurrences than to co-absences, the PCA is incapable of this type of [necessarily subjective] differentiation. Two hypothetical taxa, each occurring in a single county at opposite ends of the state, would be more similar to each other (from identical frequencies of zero in 22 of the 24 counties) than they would be to a species that occurs with them and also in all other counties. Thus, a taxon's position along Axis 1 is largely determined simply by the number of counties that it is found in. Nevertheless, once this variation is accounted for, patterns in Axis 2 that are more clearly geographical allow distinct affiliations among groups of taxa to be seen in the scatter plot (Figure 2).

Several other floristic patterns are suggested by the PCA results. The progression of eigenvector loadings on Axis 2 (righthand column of Table 3) suggests that the Coastal Plain counties are floristically more related (with respect to *Carex*) to the Allegheny Plateau county of Garrett than they are to counties that lie entirely within the less distant Ridge and Valley or the Piedmont sections. We note two phenomena that may explain this somewhat counter-intuitive observation. First, several taxa (e.g., *Carex*

Table 3. Eigenvector loadings for each county for first two axes of PCA (Figure 2).

COUNTY	Axis 1 Eigenvector	COUNTY	Axis 2 Eigenvector
Garrett	-0.0604	Worcester	0.3413
Somerset	-0.1374	Wicomico	0.3213
Wicomico	-0.1559	Dorchester	0.2683
Worcester	-0.1705	Caroline	0.2549
Carroll	-0.1817	Somerset	0.2475
Allegany	-0.1818	Calvert	0.1769
Dorchester	-0.1889	Saint Mary's	0.1599
Saint Mary's	-0.1942	Kent	0.1298
Frederick	-0.1944	Talbot	0.1212
Washington	-0.2039	Queen Anne's	0.1157
Talbot	-0.2103	Anne Arundel	0.0829
Montgomery	-0.2114	Charles	0.0353
Calvert	-0.2144	Prince Georges	-0.0264
Caroline	-0.2176	District of Columbia	-0.1166
Howard	-0.2201	Cecil	-0.1189
Cecil	-0.2203	Baltimore	-0.1507
Harford	-0.2216	Harford	-0.1527
Baltimore	-0.2218	Garrett	-0.1856
Queen Anne's	-0.2231	Howard	-0.1928
Kent	-0.2240	Montgomery	-0.1995
Prince Georges	-0.2341	Carroll	-0.2595
District of Columbia	-0.2358	Frederick	-0.2606
Charles	-0.2379	Washington	-0.2707
Anne Arundel	-0.2464	Allegany	-0.2789

atlantica ssp. *capillacea*, *C. canescens* var. *disjuncta*, *C. lacustris*, and *C. seorsa*) show a disjunct distribution, occurring throughout the Coastal Plain and in Garrett County, and being largely absent in the areas between. These are taxa that show moderate to strong preference for depressional wetlands, often those with some peat formation, such as seepages and fens. These habitat features are more extensive, if not more frequent, on both the Allegheny Plateau and on the Coastal Plain than they are in the intervening areas. Our field observations also indicate that other taxa of these habitats show a more or less continuous distribution across Maryland (e.g., *Carex atlantica* ssp. *atlantica*, *C. bromoides*, *C. folliculata*, *C. leptalea* (both subspecies considered together as a species), and *C. stricta* occur more frequent on the Allegheny Plateau and the Coastal Plain than in the intervening areas. This guild of species seems to comprise a notable phytogeographic element in the state. On the other hand, most taxa that occur with significant frequency on both sides of the Fall Line (i.e., that occur widely both in

the Coastal Plain and in the Ridge and Valley/Piedmont sections) are also widespread throughout the state and occur on the Allegheny Plateau, as well. Thus, there is no exclusively Ridge and Valley/Piedmont/Coastal Plain guild comparable to that noted for the Allegheny Plateau/Coastal Plain.

Eigenvector loadings on Axis 2 (Table 3) suggest that the Western Shore counties of Calvert and Saint Mary's are floristically more affiliated (with respect to *Carex*) with Eastern Shore counties than to other Western Shore counties. This probably reflects geologic and phytogeographic similarities between the former two counties and the Eastern Shore, including the relative predominance of lower, Quaternary age landforms (Schmidt 1993), and of the less *Carex*-rich Oak-Pine forest region (Braun 1950).

The relatively high density of taxa depicted in the lower right quadrant of the scatter plot reflects a higher contribution to taxa richness in Maryland and the District of Columbia from taxa most affiliated with the Piedmont and Appalachian areas (primarily within the Oak-Chestnut forest region), compared to those more associated with coastal areas (primarily within the Oak-Pine forest region). This pattern is consistent with the observations of Harvill (1973), who noted that *Carex* is predominantly a genus of temperate regions, in contrast to most other genera in Cyperaceae occurring in Virginia, which have more southern (tropical) affinities.

Figure 3 depicts numbers of native taxa and total taxa reported for each county. For each phytogeographic section, numbers of native taxa, total taxa, and taxa unique to the section are shown. The eastern counties of the Piedmont section and, to a lesser extent, the western counties of the Western Shore section exhibit the greatest taxa richness on a county scale. This pattern appears to be largely attributable to the position of these counties at or near the transition between the Oak-Chestnut and the Oak-Pine forest regions, where taxa more limited to one region or the other may be sympatric near their respective range limits. Within this county group, the eastern Piedmont county totals are slightly higher than those of the westernmost Western Shore counties because of their position within the *Carex*-rich (as suggested by the PCA) Oak-Chestnut forest region and to greater habitat diversity in the Piedmont due to its geologic complexity. As an example of this effect, Lea and Frye (2002) reported 90 taxa for an area of about 1,000 hectares near the Fall Line in the eastern Piedmont. The lowest county taxa richness totals generally occur in counties of the Eastern Shore section and in the southeastern counties of the Western Shore section. These areas lie within the Oak-Pine forest region, an area apparently less taxa rich with respect to *Carex* (Figure 2). Restricted taxa occur most frequently on the Allegheny Plateau and the lower Eastern Shore, which have comparatively moderate to low taxa richness but which are phytogeographically distinctive within Maryland, and also in the Piedmont, where specialized habitats associated with unusual geologic situations (e.g., serpentine barrens, Fall Line reaches of major rivers) harbor some rare taxa. Although taxa richness patterns may be somewhat influenced by the artifact of historically greater collecting efforts in the central areas, much of our own recent fieldwork, in contrast, has focused on historically poorly collected counties. Although small collecting "gaps" remain, we consider the level of collecting effort to be now thorough enough statewide so that presence/absence data effectively reflect true taxa richness patterns.

A number of the Maryland *Carex* flora are taxa at or near the limits of their known

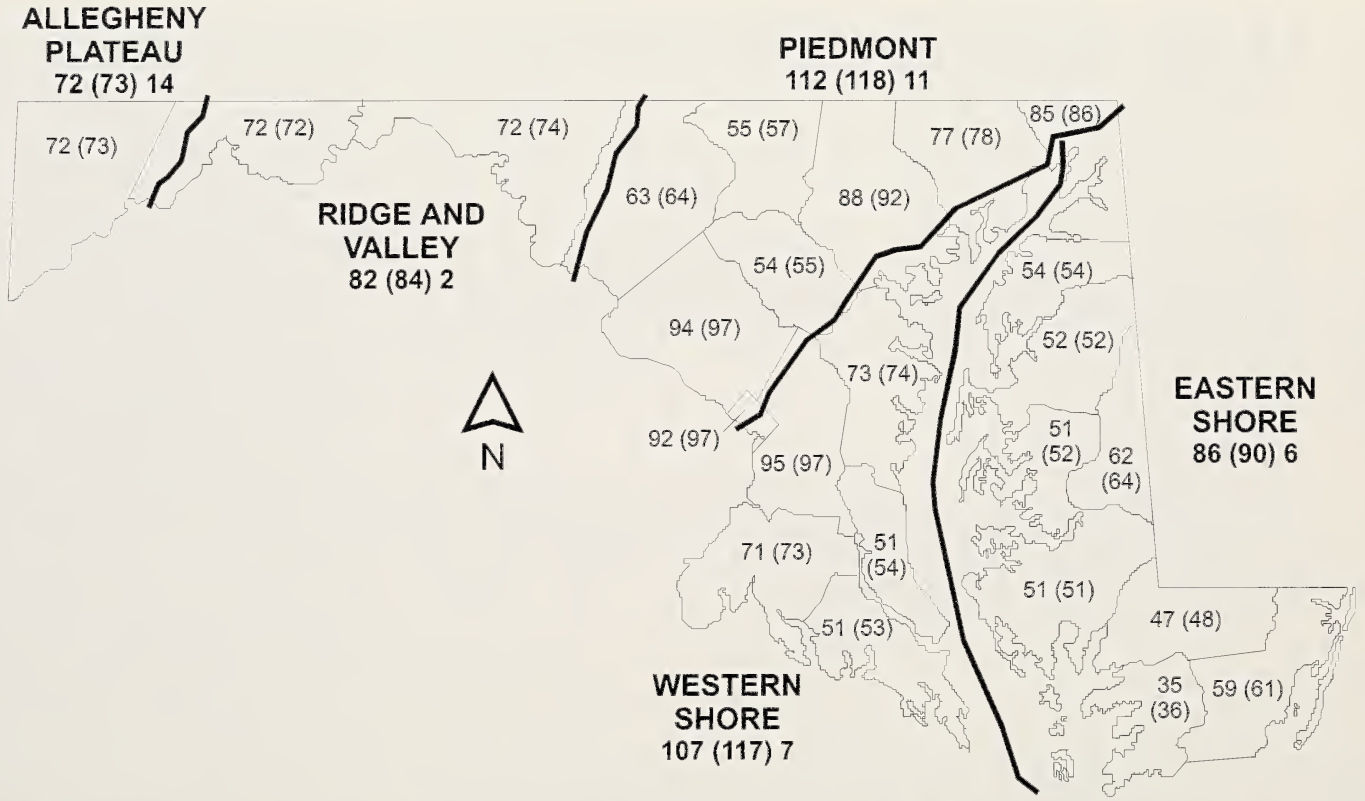


Figure 3. Map of Maryland and the District of Columbia, depicting total numbers of taxa for each county (county names depicted in Figure 1) and phytogeographic section. Sections are separated by bold lines and labeled in all capital letters. Numbers depicted for each county show (in order): native taxa and (total taxa). Numbers depicted for sections show (in order): native taxa, (total taxa), and native taxa unique to the phytogeographic section within Maryland.

geographic range in the eastern United States. These include seven taxa more common in the northern Appalachians and New England, eight taxa of the southeastern United States Coastal Plain at the northeastern limit of their range, and two midwestern species at their eastern range limits (Table 4).

Non-native species represent a fairly minor part of the *Carex* flora, with fifteen that are not indigenous to Maryland and the District of Columbia represented (one species native to Maryland, *C. plantaginea* is introduced, in part). Most non-native species appear to be waifs, rather than well naturalized taxa, with nine of the fifteen known only from a single site. Only one, *Carex kobomugi*, is considered to be competitively invasive (Small, 1954). Section *Phaestoglochin*, a group that includes a high proportion of "weedy" species, accounts for seven of our fifteen non-indigenous *Carex* species, and an eighth species (*C. aggregata*) that is possibly introduced.

Potential and Historic Carex flora of Maryland and the District of Columbia

In order to stimulate interest in further floristic exploration, we list (Ta ble 5) *Carex* taxa that have not yet been recorded in Maryland or the District of Columbia, and which we believe to be among the most likely to be found as new occurrences for our area. In general, these are taxa that are reported from adjoining counties of a neighboring state or from two or more adjoining states, or both (e.g., Tatnall 1946; Strausbaugh and Core 1978; Harvill et al. 1992; Rhoads and Klein 1993; Cusick 1996; A. S. Weakley, personal communication). Additionally, 10 native *Carex* taxa historically recorded in our area remain "lost." To our knowledge these taxa have not been reported since 1980. Eight of these are known from a single county each, and six are represented by a single collection each. With year of their last known collection, the 10 taxa are: *Carex aestivaliformis* (1946), *C. annectens* var. *xanthocarpa* (1965), *C. cephaloidea* (1899), *C. decomposita* (1920), *C. lucorum* [var. *lucorum*] (1962), *C. pallescens* (1898), *C. polymorpha* (1891), *C. sartwellii* (1938), *C. tetanica* (1925), and *C. viridula* (1879). Among non-native species, we know of no recent reports for five: *C. arenaria* (1900), *C. caryophyllea* (1880s), *C. distans* (1948), *C. divulsa* (1896), and *C. muricata* (1969). All five are known from a single county each, and only *C. arenaria* is represented by more than a single collection.

Table 4. *Carex* taxa at or nearly at their eastern United States range limits in Maryland or the District of Columbia. Based on Tatnall (1946), Fernald (1950), Strausbaugh and Core (1978), Crins and Ball (1983), Crins and Ball (1989b), Harvill et al. (1992), Rhoads and Klein (1993), A. S. Weakley (personal communication), Harmon and Ford-Werntz (2000), and Association for Biodiversity Information (2001).

MAJOR EASTERN UNITED STATES RANGE	TAXA
Northern Appalachians/New England	*cephaloidea, diandra, haydenii, lucorum* var. *lucorum, michauxiana, sartwellii, viridula*
Southeastern Coastal Plain	*corrugata, debilis* var. *intercursa, digitalis* var. *asymmetrica, digitalis* var. *macropoda, gigantea, glaucescens, species* 1, *oxylepis*
Midwest	*careyana, richardsonii*

Table 5. *Carex* taxa not yet recorded for Maryland and the District of Columbia, but have the potential to occur and to be sought as possible additions to flora [neighboring states with occurrences denoted in brackets].

TAXON	REMARKS
Carex albicans Willdenow *ex* Sprengel var. *australis* (Bailey) Rettig	Dry woods. Specimens from Great Falls area in Maryland have some characters of this southern taxon (= *C. physorhyncha* Liebman), but are problematic (Lea and Frye, 2002). [VA].
Carex atherodes Sprengel	Seeps and fens. Most likely to occur in Garrett County. [PA, VA, WV].
Carex bicknellii Britton	Serpentine barrens. Most likely to occur in north eastern Piedmont. [DE, PA].
Carex crawei Dewey	Calcareous outcrops, meadows, shores. Most likely to occur in Ridge and Valley section. [VA].
Carex deflexa Hornemann	In Appalachians, moist, high-elevation meadows. Most likely to occur in Garrett County. [WV].
Carex limosa Linnaeus	Peaty wetlands, often with *Sphagnum*. Most likely to occur in northeastern Piedmont. [DE, PA].
Carex novae-angliae Schweinitz	Sandstone outcrops; moist woods. Most likely to occur in Garrett County. [PA, WV].
Carex oligosperma Michaux	Bogs, poor fens. Most likely to occur in Garrett County. [PA, VA, WV].
Carex ormostachya Wiegand	Rocky woods, shale barrens. Most likely to occur in western Maryland. [PA, VA].
Carex pauciflora Lightfoot	Bogs, poor fens, often with *Sphagnum*. Most likely to occur in Garrett County. [PA, WV].
Carex praegracilis W. Boott	Western species, apparently spreading in eastern United States along railroads and salted highways (Reznicek and Catling 1987). Most likely to occur in western Maryland. [PA, VA].
Carex prairea Dewey *in* A. Wood	Calcareous wetlands. Most likely to occur in Ridge and Valley section. [PA, VA, WV].
Carex retrorsa Schweinitz	Swamps, stream banks, swales. Most likely to occur in northern tier of counties. [PA].
Carex schweinitzii Dewey *ex* Schweinitz	Calcareous wetlands. Most likely to occur in Ridge and Valley section. [PA, VA].
Carex siccata Dewey	Sandy woods. Most likely to occur in northeastern Piedmont. [PA].
Carex sprengelii Dewey *ex* Sprengel	Stream banks, moist woods, outcrops. Most likely to occur in northern tier of counties. [DE, PA].
Carex sterilis Willdenow	Calcareous wetlands. Most likely to occur in Ridge and Valley section. [PA, VA, WV].
Carex suberecta (Olney) Britton	Calcareous wetlands. Most likely to occur in Ridge and Valley section. [VA, WV].
Carex venusta Dewey var. *venusta*	Seepage wetlands, swamps. Most likely to occur in Charles or St. Mary's Counties. [VA].

General Comments on Annotated List of Taxa and Distribution Maps

Information for each individual *Carex* species or infraspecific taxon that we report for Maryland and the District of Columbia is presented in an annotated list, arranged in alphabetical order by Latin name. The entry for each taxon is accompanied by a map of Maryland and the District of Columbia with verified county occurrences for that taxon delineated by dots in the applicable counties. Figure 4 provides an example of how to interpret the information presented in the annotated list.

In general, our treatments for the Latin names and authors of species and infraspecific taxa follow Kartesz and Meacham (1999), with some modifications. Where consensus is divided on whether a taxon should be recognized individually or not, we have tended to take a "splitter's" approach whenever our examination of Maryland material suggested that reasonably consistent and possibly significant phenetic, phytogeographical, and/or ecological differences could be detected. Such an approach helps to ensure that information that may be valuable for future resolution of taxonomic issues is not lost.

Common names are derived from a variety of sources, including Reed (1988), Maryland Natural Heritage Program (1994) and U.S. Department of Agriculture (2001). Where a common name was otherwise unavailable, we use an approximate translation of the Latin specific or subspecific epithet. The use of particular common names here is not intended to be authoritative or "standard."

Infrageneric sectional taxonomy of *Carex* has undergone many recent changes in order to incorporate the results of taxonomic research and to resolve nomenclatural problems. Our sectional treatments follow those of Reznicek (personal communication); some may be unfamiliar to users of older manuals (e.g, Fernald 1950; Brown and Brown 1984; Gleason and Cronquist 1991). In the annotated list, we list for each taxon the section (our treatment), followed by a more traditional (alternative) sectional treatment listed, if applicable (Figure 4). This should be considered a "crosswalk" for the user's convenience rather than a synonymy; some traditional section names may be synonyms; others may represent former or alternative sectional assignments for taxa.

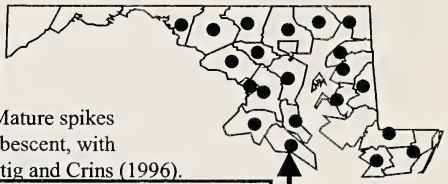
In listing synonyms for taxa, we employ terms such as "in part," "misapplied," "in the broad sense," and "in the narrow sense" in their usual botanical meanings. It should be understood that the application of these terms and other conclusions about synonymy sometimes has required our best judgement in the face of uncertainties about other authors' concepts.

For each taxon in the annotated list, we provide a brief description of diagnostic characters, primarily those useful for differentating taxa from their closest relatives. Citations of sources that describe identification, taxonomy, distribution, ecology, and/or nomenclature are listed, when applicable. Descriptions of habitats apply to those known for Maryland and the District of Columbia. Sources for the occurrences of taxa in neighboring states include the state and regional references listed in Figure 4 and also Rhoads and Klein (1993), Cusick (1996), A. S. Weakley (personal communication), Harmon and Ford-Werntz (2000), McAvoy and Bennett (2001), and, occasionally, specimens in collections seen by us. Generally, we report these as they have been listed by the

Common Name

Section Name (Traditional Section Name)

Carex umbellata Schkuhr *ex* Willdenow
Umbellate Sedge | *Acrocystis (Montanae)*
(KM, RB, T; in part only, -- BR, GC, H, SC; *C. abdita* Bicknell -- F; *C. tonsa* (Fernald) Bicknell, in part -- HS)
Densely cespitose sedge, with narrow (1-3 mm) leaves. Mature spikes nearly hidden among leaf bases. Perigynium minutely pubescent, with the beak half as long as the body. See Cusick (1992), Rettig and Crins (1996).
Dry forests and openings. DE, PA, VA, WV | Common, PD, WS, ES; infrequent, RV.



Maryland-District of Columbia Distribution Map.
Dots denote counties of occurrence

Alternative treatments

Alternative treatments are separated by semicolons, with each treatment followed by the source(s) that use it. Where a treatment is not specified for a source, refer to the immediately preceding name.

Sources

BR = Brown and Brown (1984)
F = Fernald (1950)
GC = Gleason and Cronquist (1991)
H = Harvill et al. (1992)
HS = Hitchcock and Standley (1919)
KM = Kartesz and Meacham (1999)
RB = Rhoads and Block (2000)
SC = Strausbaugh and Core (1978)
T = Tatnall (1946)

For the example above, Kartesz and Meacham, Rhoads and Block, and Tatnall also treat this taxon as *C. umbellata* Schkuhr *ex* Willdenow,as we do; Brown and Brown, Gleason and Cronquist, Harvill et al., and Strausbaugh and Core treat it as *Carex umbellata* Schkuhr *ex* Willdenow (as do the immediately preceding authors), but in part only; Fernald treats it as *Carex abdita* Bicknell; Hitchcock and Standley treat it as *Carex tonsa* (Bicknell) Fernald, in part. (Author abbreviations preceded by "infraspecific taxa not distinguished" indicate that the authors use the same species treatment as we do, but do not recognize subspecies or varieties).

Distribution and abundance by phytogeographic section

Abundance*	**Section Abbreviation******
Common	AP = Allegheny Plateau
Frequent	RV= Ridge and Valley
Infrequent	PD = Piedmont
Rare**	WS = Western Shore
Naturalized or adventive***	ES = Eastern Shore

* ordinal scale in decreasing order of abundance

** "Single station" indicates that there is one known record of the taxon in our area (extant). "Single Collection" indicates one known record (historical).

*** non-indigenous taxa (all can be considered rare, where they occur); naturalized indicates that the taxon is well established; adventive indicates that it is likely a waif).

**** The symbol "-h" following a section abbreviation indicates that the taxon is historical for [only] that section (i.e., there are no known post-1980 records).

States adjacent to Maryland where taxon occurs

DE	Delaware
PA	Pennsylvania
VA	Virginia
WV	West Virginia
none	not known from surrounding states

** The symbol "-h" following a state abbreviation indicates that the taxon is historical (not known to be extant) for that state.

Figure 4. Example of an atlas taxon entry.

source, as the scope of this project did not allow for our own specimen-based evaluation of reports from other states. A subjective ordinal scale (common, frequent, infrequent, or rare) describes taxon abundance.

Acknowledgements

Mark Strong and other staff of the U.S. National Herbarium, Charles Delwiche of the University of Maryland (Norton-Brown) Herbarium, Kevin Conrad of the National Arboretum, Ted Bradley of George Mason University, Ernie Schuyler of the Academy of Natural Sciences, and staff of the Cylburn Arboretum provided access to collections or other support. Tony Reznicek of the University of Michigan made determinations of some difficult specimens, shared unpublished information on *Carex* sectional nomenclature, and generously provided invaluable advice. Bill McAvoy of the Delaware Natural Heritage Program contributed a wealth of information on Eastern Shore records. Tom Wieboldt of Virginia Polytechnic Institute and State University provided information on *Carex* in Virginia. Rob Naczi of Delaware State University provided several determinations of and information on taxa in Sections *Careyanae*, *Griseae*, and *Laxiflorae*. Marcia Waterway of McGill University, Lisa Standley, and Norbert Roeder shared information on *Carex debilis, Carex caryophyllea,* and *Carex distans,* respectively. Alan Weakley of Association for Biodiversity Information, P.J. Harmon of the West Virginia Department of Natural Resources, and Donna Ford-Werntz of West Virginia University shared preliminary drafts of work in progress and provided up-to-date taxa occurrence information for Virginia and West Virginia, respectively. Charles Davis, Frank Hirst, and Ron Wilson made personal collections available for examination. Maryland Department of Natural Resources volunteer Dan Siehl processed and mounted at the Tawes herbarium a number of specimens collected during this study. Julia Mensler, formerly of the Worcester County government, gave Geographic Information Systems guidance for producing initial versions of the county occurrence maps. Ashton Berdine, Carol DiSalvo, Joe Kish, Warren Steiner, Jil Swearingen, Ed Thompson, and Mary Troy are thanked for various aspects of logistical support. Bill McAvoy, Tony Reznicek, Stan Shetler, and Rob Naczi provided critical and useful comments to improve the manuscript. The National Park Service, Maryland Department of Natural Resources, and the Maryland/DC Chapter of The Nature Conservancy granted permission to collect specimens on lands they manage. Funding was provided by the Washington Biologists' Field Club Research Fund and The Nature Conservancy's Virginia E. Crouch Memorial Fund. Additional support was provided by the Maryland Department of Natural Resources Wildlife and Heritage Service and by the National Park Service, Assateague Island National Seashore.

Literature Cited

Association For Biodiversity Information. 2001. *Natureserve: An Online Encyclopedia of Life. Version 1.5*. Arlington, VA. http://www.natureserve.org/.

Braun, E. L. 1950. *Deciduous Forests of Eastern North America*. Blakiston Company, Philadelphia, PA.

Brown, M. L., and R. G. Brown. 1984. *Herbaceous Plants of Maryland*. Port City Press, Baltimore, MD.

Bruederle, L. P., and D. E. Fairbrothers. 1986. Allozyme variation in populations of the *Carex crinita* complex (Cyperaceae). *Systematic Botany* 11:583-594.

Bruederle, L. P., D. E. Fairbrothers, and S. L. Hanks. 1989. A systematic circumscription of *Carex mitchelliana* (Cyperaceae) with reference to taxonomic status. *American Journal of Botany* 76:124-132.

Catling, P. M., A. A. Reznicek, and W. J. Crins. 1993. *Carex juniperorum* (Cyperaceae) a new species from northeastern North America, with a key to *Carex* sect. *Phyllostachys*. *Systematic Botany* 18:496-501.

Crins, W. J., and P. W. Ball. 1983. The taxonomy of the *Carex pensylvanica* complex (Cyperaceae) in North America. *Canadian Journal of Botany* 61:1692-1717.

Crins, W. J., and P. W. Ball. 1989a. Taxonomy of the *Carex flava* complex (Cyperaceae) in North America and northern Eurasia, numerical taxonomy and character analysis. *Canadian Journal of Botany* 67:1032-1047.

Crins, W. J. and P. W. Ball. 1989b. Taxonomy of the *Carex flava* complex (Cyperaceae) in North America and northern Eurasia, taxonomic treatment. *Canadian Journal of Botany* 67:1048-1065.

Cusick, A. W. 1992. *Carex* section *Acrocystis* (Cyperaceae) in Ohio. *Michigan Botanist* 31:99-108.

Cusick, A. W. 1996. Notes on the genus *Carex* (Cyperaceae) in West Virginia. *Castanea* 61:161-167.

Fernald, M. L. 1938. Noteworthy plants of southeastern Virginia. *Rhodora* 40:400-401.

Fernald, M. L. 1942. Critical notes on *Carex*. *Rhodora* 44:281-331.

Fernald, M. L. 1950. *Gray's Manual of Botany. 8th Edition*. Dioscorides Press, Portland, OR.

Fleming, G. P., and J. C. Ludwig. 1996. Noteworthy collections—Virginia. *Castanea* 61:89-95.

Gauch, H. G., Jr. 1982. *Multivariate Analysis in Community Ecology*. Cambridge University Press, Cambridge, UK.

Gleason, H. A., and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*. New York Botanical Garden, Bronx, NY.

Harmon, P. J., and D. Ford-Werntz (eds). 2000. *Checklist and Draft Preliminary Atlas of the Vascular Plants of West Virginia*. West Virginia Division of Natural Resources, Elkins, WV. Wildlife Resources Technical Document 00-08.

Harvill, A. M., Jr. 1973. Phytogeography of the carices of Virginia. *Rhodora* 75:248-257.

Harvill, A. M., Jr., T. R. Bradley, C. E. Stevens, T. P. Wieboldt, D. M. E. Ware, D. W. Ogle, G. W. Ramsey, and G. P. Fleming. 1992. *Atlas of the Virginia Flora*. Virginia Botanical Associates, Burkeville, VA.

Hermann, F. J. 1941. *A Checklist of Plants in the Washington-Baltimore Area*. Conference on District Flora, Smithsonian Institution, Washington, DC.

Hermann, F. J. 1946. *A Checklist of Plants in the Washington-Baltimore Area. Edition 2*. Conference on District Flora, Smithsonian Institution, Washington, DC.

Hitchcock, A. S., and P. C. Standley. 1919. Flora of the District of Columbia and vicinity. *Contributions of the U.S. National Herbarium* 21:1-329.

Holmgren, P. K., N. H. Holmgren, and L. C. Barrett. 1990. Index Herbariorum. Part 1. Edition 8. *Regnum Veg.* 120:x, 1-693.

Jackson, D. A. 1993. Stopping rules in principle components analysis: a comparison of heuristical and statistical approaches. *Ecology* 74: 2204-2214.

Jermy, A. C., A. O. Chater, and R. W. David. 1982. *Sedges of the British Isles, 2nd Edition.* Botanical Society of the British Isles Handbook no. 1, London.

Jones, S. D., and A. A. Reznicek. 1995. *Carex conjuncta* (Cyperaceae) verified for Arkansas, and notes on the range of *Carex oklahomensis*. *Sida* 16:772-774.

Kartesz, J. T., and C. A. Meacham. 1999. *Synthesis of the North American Flora, Version 1.0.* Biota of North America Program, North Carolina Botanical Garden, Chapel Hill, NC.

Lea, C., and C. T. Frye. 2002. A survey of sedges of the genus *Carex* (Cyperaceae) in the Potomac River Gorge of Maryland, Virginia, and the District of Columbia. *Bartonia* 61:93-116.

Mackenzie, K. K. 1931. Cyperaceae, tribe 2, Cariceae. *North American Flora.* 18:1-168. New York Botanical Garden, New York, NY.

Mackenzie, K. K. 1935. Cyperaceae, tribe 2, Cariceae. *North American Flora.* 18:169-478. New York Botanical Garden, New York, NY.

Manhart, J. R. 1986. Foliar flavenoids of the North American members of *Carex* section *Laxiflorae* (Cyperaceae). *Biochemical Systematics and Ecology* 14:85-90.

Maryland Natural Heritage Program. 1994. *Rare, Threatened, and Endangered Plants of Maryland.* Department of Natural Resources, Annapolis, MD.

McAvoy, W. A., and K. A. Bennett. 2001. *The Flora of Delaware: An Annotated Checklist.* Delaware Natural Heritage Program (Document No. 40-05/01/01/01), Smyrna, DE.

McClintock, K. A., and M. J. Waterway. 1994. Genetic differentiation between *Carex lasiocarpa* and *Carex pellita* (Cyperaceae) in North America. *American Journal of Botany* 81:224-231.

McCune, B., and M. J. Mefford. 1997. PC-ORD. *Multivariate Analysis of Ecological Data, Version 3.04 MjM.* Software Design, Gleneden Beach, OR.

Naczi, R. F. C. 1990. The taxonomy of *Carex bromoides* (Cyperaceae). *Contributions of the University of Michigan Herbarium* 17: 215-222.

Naczi, R. F. C. 1993. *Carex brysonii* and *Carex godfreyi,* new species of *Carex* section *Griseae* (Cyperaceae) from the southeastern United States. *Contributions of the University of Michigan Herbarium* 19: 195-205.

Naczi, R. F. C. 1997. *Carex pigra*, a new species of *Carex* section *Griseae* (Cyperaceae) from the southeastern United States of America. *Novon* 7:67-71.

Naczi, R. F. C. 1999. *Carex planispicata*, a widespread and frequent new species of *Carex* section *Griseae* (Cyperaceae) from the eastern United States of America. *Journal of the Kentucky Academy of Sciences* 60:37-44.

Naczi, R. F. C., R. Kral, and C. T. Bryson. 2001. *Carex cumberlandensis*, a new species of Section *Careyanae* (Cyperaceae) from the eastern United States of America. *Sida* 19: 993-1014.

Naczi, R. F. C., A. A. Reznicek, and B. A. Ford. 1998. Morphological, geographical and ecological differentiation in the *Carex willdenowii* complex (Cyperaceae). *American Journal of Botany* 85:434-447.

Pielou, E. C. 1984. *The Interpretation of Ecological Data: A Primer on Classification and Ordination*. John Wiley & Sons, New York.

Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands: 1988 National Summary*. U.S. Dept. of Interior, Fish and Wildlife Service, St. Petersburg, FL.

Rettig, J. H. 1989. Nomenclatural changes in the *Carex pensylvanica* group (section *Acrocystis*) of North America. *Sida* 13:449-452.

Rettig, J. H. 1990a. Achene micromorphology of the *Carex nigromarginata* complex (Section *Acrocystis*, Cyperaceae). *Rhodora* 92:70-79.

Rettig, J. H. 1990b. Correct names for the varieties of *Carex albicans / C. emmonsii*. *Sida* 14:132-133.

Rettig, J. H., and W. J. Crins. 1996. New combinations in *Carex* section *Acrocystis*. *Novon* 6:117-118.

Reznicek, A. A. 1989. New England *Carex* (Cyperaceae): Taxonomic problems and phytogeographical considerations. *Rhodora* 91:144-152.

Reznicek, A. A. and P. W. Ball. 1974. The taxonomy of *Carex* series *Lupulinae* in Canada. *Canadian Journal of Botany* 52:2387-2399.

Reznicek, A. A., and P. W. Ball. 1980. The taxonomy of *Carex* section *Stellulatae* in North America north of Mexico. *Contributions of the University of Michigan Herbarium* 14:153-203.

Reznicek, A. A., and P. M. Catling. 1986. *Carex striata*, the correct name for *C. walteriana* (Cyperaceae). *Rhodora* 88:405-406.

Reznicek, A. A., and P. M. Catling. 1987. *Carex praegracilis* (Cyperaceae) in eastern North America: a remarkable case of rapid invasion. *Rhodora* 89:205-216.

Reznicek, A. A., and M. S. Gonzalez-Elizondo. 1999. New species of *Carex* (Cyperaceae) from Chiapas, Mexico. *Contributions of the University of Michigan Herbarium* 22:121-130.

Rhoads, A. F., and T. A. Block. 2000. *The Plants of Pennsylvania: An Illustrated Manual*. University of Pennsylvania Press, Philadelphia, PA.

Rhoads, A. F., and W. M. Klein, Jr. 1993. *The Vascular Flora of Pennsylvania: Annotated Checklist and Atlas*. The American Philosophical Society, Philadelphia, PA.

Rothrock, P. E. 1991. The identity of *Carex albolutescens, C. festucacea,* and *C. longii* (Cyperaceae). *Rhodora* 93:51-66.

Rothrock, P. E., and A. A. Reznicek. 2001. The taxonomy of the *Carex bicknellii* group (Cyperaceae) and new species for central North America. *Novon* 11:205-228.

Rothrock, P. E., A. A. Reznicek, and L. R. Ganion. 1997. Taxonomy of the *Carex straminea* complex (Cyperaceae). *Canadian Journal of Botany* 75:2177-2195.

Schmidt, M. F., Jr. 1993. *Maryland's Geology*. Tidewater Publishers, Centreville, MD.

Shreve, F., M. A. Chrysler, F. H. Blodgett, and F. W. Besley. 1910. *The Plant Life of Maryland*. Maryland Weather Service Special Publication Vol. III. The Johns Hopkins Press, Baltimore, MD.

Small, J. A. 1954. *Carex kobomugi* at Island Beach, New Jersey. *Ecology* 35:289-291.

Standley, L. A. 1983. A clarification of the status of *Carex crinita* and *C. gynandra* (Cyperaceae). *Rhodora* 85:229-241.

Standley, L. A. 1989. Taxonomic revision of the *Carex stricta* (Cyperaceae) complex in eastern North America. *Canadian Journal of Botany* 67:1-14.

Standley, L. A., and J. L. Dudley. 1991. Vegetative and sexual reproduction in the rare sedge *Carex polymorpha* (Cyperaceae). *Rhodora* 93:268-290.

Strausbaugh, P. D., and E. L. Core. 1977. *Flora of West Virginia, 2nd Edition*. Seneca Books, Morgantown, WV.

Tatnall, R. R. 1946. *Flora of Delaware and the Eastern Shore*. Society of Natural History of Delaware, Lancaster, PA.

Terrell, E. E., J. L. Reveal, R. W. Spjut, R. F. Whitcomb, J. H. Kirkbride Jr., M. T. Cimino, and M. T. Strong. 2000. *Annotated List of the Flora of Beltsville Agicultural Research Center, Beltsville, Maryland*. USDA, Agricultural Research Service. ARS-155.

Tutin, T. G., V. H. Heywood, N. A. Burges, D. M. Moore, D. H. Valentine, S. M. Walters, and D. A. Webb. 1980. *Flora Europea. Volume V*. Cambridge University Press, Cambridge, U.K.

U.S. Department of Agriculture. 2001. *Integrated Taxonomic Information System*. http://www.itis.usda.gov.

Ward, L. 1881. Guide to the flora of Washington and vicinity. *Bulletin of the United States National Museum* 22. U.S. Government Printing Office, Washington, DC.

Webber, J. M., and P. W. Ball. 1979. Proposals to reject *Carex rosea* and *Carex radiata* of eastern North America (Cyperaceae). *Taxon* 28:611-616

Webber, J. M., and P. W. Ball. 1984. The taxonomy of the *Carex rosea* group (section *Phaestoglochin*) in Canada. *Canadian Journal of Botany* 62:2058-2073.

Wheeler, G. A., and G. B. Ownbey. 1984. Annotated list of Minnesota carices, with phytogeographical and ecological notes. *Rhodora* 86:151-231.

Wujek, D. E., and F. J. Menapace. 1986. Taxonomy of *Carex* section *Folliculatae* using achene morphology. *Rhodora* 88:399-403.

Carex abscondita Mackenzie
Thicket Sedge *Careyanae (Laxiflorae)*
(BR, F, GC, H, HS, KM, RB, T)

Forms distinct, leafy clumps. Perigynium trigonous, with sharp angles. Similar to *C. digitalis*, but with lowest bract overtopping inflorescence; upper bract spathe-like; the short (4-12 mm) terminal (staminate) spike often hidden among the uppermost lateral (pistillate) spikes. See Manhart (1986). Mesic to moist forests, with bottomland hardwoods or loblolly pine; seepages. [DE, VA, WV-h]. Common, WS, ES.

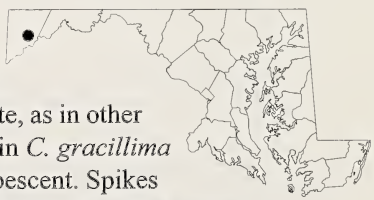
Carex acutiformis Ehrhart
Lesser Pond Sedge *Paludosae*
(F, GC, KM)

Similar to *C. lacustris*, but with leaves narrower; spikes more slenderly cylindrical (6-7 mm wide); perigynia smaller (3.5-4.0 mm long), papillose, and more compressed (flattened-trigonous). See Jermy et al. (1982). Fresh marsh. [none]. Locally naturalized (European) (single station), WS.

Carex aestivaliformis Mackenzie
False Summer Sedge *Hymenochlaenae (Gracillimae)*
(GC, KM; *C.* x *aestivaliformis* — F, T; *C. aestivalis* Schweinitz x *C. gracillima* Schweinitz — RB)

Similar to *C. aestivalis*, but leaves wider (2-6 mm) and spikes wider (3-4 mm); perigynium orifice bidentate. Some authors treat as a hybrid between *C. aestivalis* and *C. gracillima*, but persuasive evidence for this has not been presented. Rich forests. [PA, VA]. Rare (single collection), ES-h.

Carex aestivalis M. A. Curtis *ex* Gray
Summer Sedge *Hymenochlaenae (Gracillimae)*
(BR, F, GC, H, KM, SC; *C. aestivalis* Schweinitz — RB)

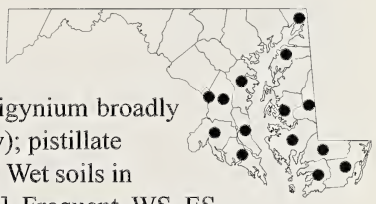


Lateral (pistillate) spikes relatively narrow and elongate, as in other members of section; terminal spike gynecandrous, as in *C. gracillima* and *C. prasina*. Leaves 2-3 mm wide; leaf sheaths pubescent. Spikes loosely ascending, narrow (2-3 mm); perigynium beakless, with orifice entire. Brown and Brown (1984) report likely based on a misidentified specimen; first known Maryland collection was in 1984. Circumneutral mesic woodland. [PA, VA, WV]. Rare (single station), AP.

Carex aggregata Mackenzie
Glomerate Sedge *Phaestoglochin (Bracteosae)*
(BR, F, HS, KM, RB, SC; *C. sparganioides* Muhlenberg *ex* Willdenow var. *aggregata* (Mackenzie) Gleason — GC; *C. sparganioides*, in part — H)

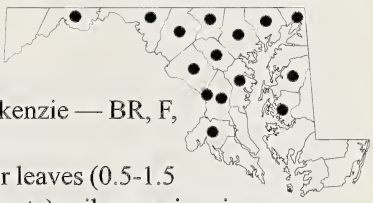
Similar to *C. muhlenbergii*, but leaf sheaths septate-nodulose, loose, with inner bands firm, concave at summit. Lower spikes crowded; leaves narrower (3-6 mm) than in *C. sparganioides*. Open or forested habitats, often weedy. [DE, PA, VA, WV]. Frequent, RV, PD, WS; rare, ES. Perhaps naturalized (from farther west).

Carex alata Torrey
Broad-winged Sedge *Ovales*
(BR, F, KM, GC, H, HS, RB, T)



Coarse sedge in tussocks; inflorescence crowded; perigynium broadly winged, obovate (widest above the middle of the body); pistillate scales acuminate to awned. See Rothrock et al. (1997). Wet soils in open areas, often along fresh tidal creeks. [DE, PA, VA]. Frequent, WS, ES.

Carex albicans Willdenow *ex* Sprengel var. ***albicans***
White-tinged Sedge *Acrocystis (Montanae)*
(GC, KM; infraspecific taxa not distinguished — H; *C. albicans*, in a narrow sense — RB; *C. artitecta* Mackenzie — BR, F, SC, T; *C. emmonsii* Dewey, in part — HS)



Similar to *C. pensylvanica*, but cespitose, with narrower leaves (0.5-1.5 mm), and shorter (0.35-1.50 cm), sessile terminal (staminate) spikes; perigynium body ellipsoid to fusiform-obovoid. Similar to var. *emmonsii*, but culms erect to arching; midribs of staminate scales evanescent below scale apex. See Rettig (1989, 1990a, 1990b). Dry forests. [DE, PA, VA, WV]. Common, RV, PD, WS; infrequent, ES.

Carex albicans Willdenow *ex* Sprengel var. ***emmonsii*** (Dewey) Rettig
Emmons' Sedge *Acrocystis (Montanae)*
(GC, KM; *C. emmonsii* Dewey *ex* Torrey — BR, F, RB, T; in part only — HS; infraspecific taxa not distinguished — H)

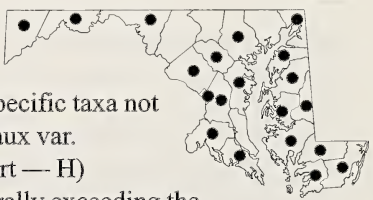
Distinguished from var. *albicans* by its decumbent culms (often hidden in ground litter) and acuminate staminate scales, with strong, often excurrent, midrib. See Rettig (1989, 1990a, 1990b), Cusick (1992). Dry forests, usually more acidic than for the var. *albicans*. [DE, PA, VA]. Common, WS, ES; infrequent, PD.

Carex albolutescens Schweinitz
Green-White Sedge *Ovales*
(BR, F, GC, KM, RB; in part only — H; *C. straminea* Willdenow *ex* Schkuhr, misapplied — HS, T)
Similar to *C. longii* and *C. festucacea*. Perigynium body obovate (widest above the middle), with narrow beak. Style strongly contorted. See Rothrock (1991). Moist to mesic forests; swamps; vernal pools; ditches; meadows. [DE, PA, VA, WV]. Common, ES, WS; infrequent, PD; rare, RV(disjunct).

Carex albursina Sheldon
White Bear Sedge *Laxiflorae*
(BR, F, GC, H, HS, KM, RB, SC, T)
Leaves very wide (15-40 mm), green, and overwintering. Leaf bases green-white. Culms wing-angled. Terminal (staminate) spike overtopped by or only slightly exceeding uppermost lateral (pistillate) spikes; uppermost inflorescence bracts spathe-like and concealing uppermost spikes,when viewed abaxially. See Manhart (1986). Rich forests, on calcareous or alluvial soils. [PA, VA, WV]. Frequent, RV; infrequent, AP; rare, PD, WS.

Carex amphibola Steudel
Eastern Narrow-leaf Sedge *Griseae (Oligocarpae)*
(RB; in part only: — GC, HS, SC; *C. amphibola* Steudel var. *rigida* (Bailey) Fernald — BR, F, KM; in part — H, T)
Similar to *C. grisea*, *C. planispicata*, *C. corrugata*. Shoot bases green to brown; perigynia spirally imbricate, little inflated, trigonous, 2.5-3.1 times as long as wide; summit of achene rounded. See Naczi (1993, 1999). Mesic forests and meadows; floodplains. [DE, PA, VA, WV]. Common, RV, PD; frequent, AP, WS; infrequent (rare southward), ES.

Carex annectens (Bicknell) Bicknell var. ***annectens***
Yellowfruit Sedge *Multiflorae*
(F, KM; *C. annectens*, in a narrow sense — SC; infraspecific taxa not distinguished — BR, HS, RB, T; *C. vulpinoidea* Michaux var. *ambigua* F. Boott, in part — GC; *C. vulpinoidea*, in part — H)
Similar to *C. vulpinoidea*, but with mature culms generally exceeding the leaves; perigynium beak shorter than the body. Perigynium brown-stramineous; nerves evident. Moist soils, usually in open. [DE, PA, VA, WV]. Common, PD, WS, ES; infrequent, AP, RV.



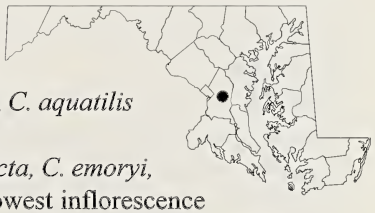
Carex annectens (Bicknell) Bicknell var. ***xanthocarpa*** (Kükenthal) Wiegand
Yellowfruit Sedge *Multiflorae*

(F, KM; infraspecific taxa not distinguished — BR, HS, RB, T; *C. vulpinoidea* Michaux var. *ambigua* F. Boott, in part — GC; *C. vulpinoidea*, in part — H; *C. brachyglossa* Mackenzie — SC)
Inflorescence more compact than in var. *annectens*; perigynium golden yellow, inconspicuously nerved or nerveless. Habitat as for var. *annectens*, possibly in less acidic soils. [VA, WV]. Rare, PD-h, WS-h.

Carex appalachica Webber and Ball
Appalachian Sedge *Phaestoglochin (Bracteosae)*

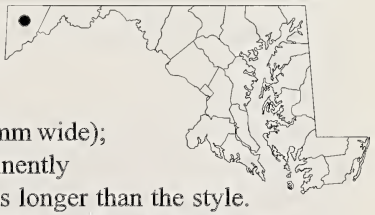
(GC, KM, RB; *C. radiata* (Wahlenberg) Dewey, misapplied — BR, F, SC, T; *C. rosea* Willdenow, in part — H; *C. convoluta* Mackenzie, in part — HS)
Similar to *C. rosea* and *C. radiata*. Leaves narrow (0.9-1.5 mm). Mature perigynia ascending, 2-6 per spike. Achene base is 0.1-0.5 mm from perigynium base. Stigmas mostly tightly coiled. See Webber and Ball (1979, 1984). Dry to mesic forests. [PA, VA, WV]. Rare, AP, RV, PD-h. Perhaps overlooked.

Carex aquatilis Wahlenberg var. ***substricta***
Kükenthal Aquatic Sedge *Phacocystis (Acutae)*



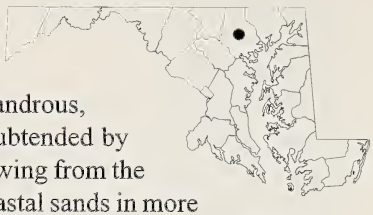
(F, GC; infraspecific taxa not distinguished — HS, RB; *C. aquatilis* var. *aquatilis*, in part — KM)
Distinguished from similar members of section (*C. stricta, C. emoryi, C. haydenii*) in being phyllopodic and in having the lowest inflorescence bract well overtopping inflorescence. Perigynium inflated, obovate, nerveless. Reported for District of Columbia by Hitchcock and Standley (1919); first reported by Terrell et al. (2000). Marshy swale. [PA, VA]. Rare (single station), WS.

Carex arctata W. Boott *ex* Hooker
Black Sedge *Hymenochlaenae (Sylvaticae)*



(F, GC, KM, RB)
Similar to *C. debilis*, but with basal leaves wider (6-10 mm wide); pistillate scales cuspidate or awned; perigynium prominently trigonous and tight around the sessile achene, which is longer than the style. See Fleming and Ludwig (1996). Dry, open oak forest. [PA, VA, WV]. Rare (single station), AP.

Carex arenaria Linnaeus
Sand Sedge *Arenariae*
(BR, F, GC, H, KM, T)



Coastal species with cordlike rhizomes. Spikes gynecandrous, androgynous, or entirely staminate, the lower often subtended by leafy bracts. Margin of perigynium forms a wide, thin wing from the middle to the beak. See Jermy et al. (1982). Ballast; coastal sands in more natural habitats in adjacent states. [DE, VA]. Locally adventive (European), WS-h.

Carex argyrantha Tuckerman
Hay Sedge *Ovales*
(BR, F, GC, H, KM, RB, SC; *C. foenea* Willdenow, misapplied)

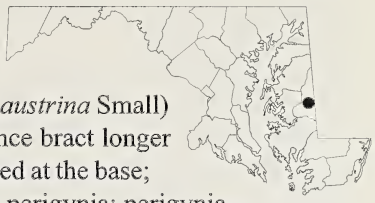
Leaves pale green. Inflorescence interrupted. Perigynium silvery-green, strongly nerved on both faces, finely granular-papillose. Pistillate scales as long as, but narrower than, the perigynia. Sandy or rocky forests and openings. [DE-h, PA, VA, WV]. Infrequent, AP; rare, RV-h, PD-h.

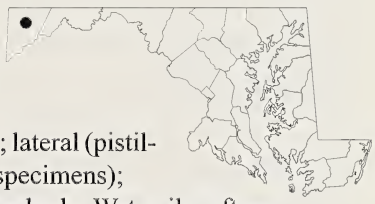
Carex atlantica Bailey ssp. ***atlantica***
Bog Sedge *Stellulatae*
(KM, RB; *C. atlantica,* in a narrow sense — BR, F, H, T; *C. atlantica* var. *atlantica* — GC; *C. incomperta* Bicknell — BR, F, HS, SC, T; *C. cephalantha* Bicknell, misapplied, — HS)

Perigynium strongly nerved adaxially; beak less than 1 mm long. Similar to ssp. *capillacea,* but with widest leaves more than 1.6 mm wide; infructescence more than 19 mm long. See Reznicek and Ball (1980). Swampy forests; seepages; fens; peatlands. [DE, PA, VA, WV]. Common, AP; frequent, RV, PD, WS, ES.

Carex atlantica Bailey ssp. ***capillacea*** (Bailey) Reznicek
Howe's Sedge *Stellulatae*
(KM, RB; *C. atlantica* var. *capillacea* Bailey — GC; *C. howei* Mackenzie — BR, F, H, HS, SC, T)

Similar to ssp. *atlantica* (intermediate plants occur), but with widest leaves less than 1.6 mm wide, leaves typically becoming involute; infructescence less than 19 mm long. See Reznicek and Ball (1980). Swampy forests; seepages; peatlands. [DE, PA, VA]. Frequent, WS, ES; rare, AP (disjunct), PD-h.

Carex austrina (Small) Mackenzie
Southern Sedge *Phaestoglochin (Bracteosae)*
(F, KM; *C. muhlenbergii* Schkuhr *ex* Willdenow var. *australis* Olney *ex* Bailey — GC; *C. muhlenbergii* var. *austrina* Small)

Resembles *C. muhlenbergii*, but lowermost inflorescence bract longer (the free portion 10-50 mm long vs. 5-20 mm) and dilated at the base; pistillate scales longer and wider, covering most of the perigynia; perigynia slightly larger (3.5 – 4.0 mm long, 2.5-3.0 mm wide) and strongly ascending (not spreading) at maturity. Meadow. [none]. Locally adventive (from south-central United States) (single station), ES.

Carex baileyi Britton
Bailey's Sedge *Vesicariae (Pseudocypereae)*
(BR, F, GC, H, KM, RB, SC)

Similar to *C. lurida*, but leaves narrower (2-4 mm wide); lateral (pistillate) spikes narrower (less than 13 mm wide in mature specimens); perigynium abruptly contracted to a beak as long as the body. Wet soils, often in open habitats, at high elevations. [PA, VA, WV]. Frequent, AP.

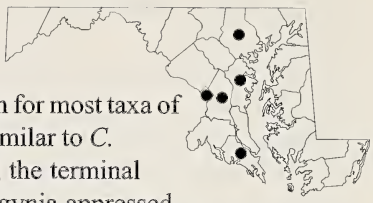
Carex barrattii Schweinitz and Torrey
Barratt's Sedge *Limosae*
(BR, F, GC, H, KM, RB, T)

Strongly rhizomatous sedge; rarely flowering. Lateral (pistillate) spikes drooping on slender peduncles, often staminate at tip. Perigynium beakless and finely papillose. Pistillate and staminate scales dark purple. Forested or open non-tidal wetlands; Delmarva Bays. [DE, PA-h, VA]. Infrequent, ES; rare, WS.

Carex blanda Dewey
Charming Sedge *Laxiflorae*
(BR, F, GC, H, HS, KM, RB, SC, T)

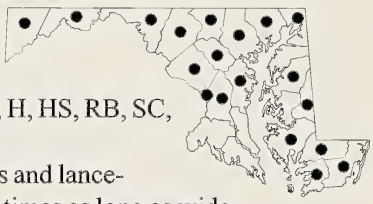
Similar to other members of the section; perigynium obovate, asymmetrical, with abruptly bent beak. Distinguished from *C. gracilescens* by green, brown, or white (not purple) basal sheaths and pale and subsessile terminal (staminate) spike. See Manhart (1986). Forests, edges, and floodplains, often on disturbed soils; somewhat weedy. [DE, PA, VA, WV]. Common, RV, PD, WS; frequent, AP, ES (rare southward).

Carex brevior (Dewey) Mackenzie *ex* Lunell
Short-beaked Sedge *Ovales*
(BR, F, H, HS, KM, RB, SC, T; in part only — GC)



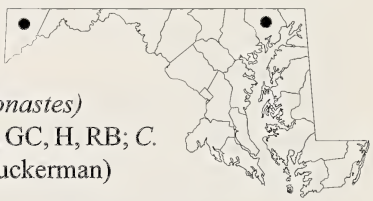
Perigynium body orbicular and wider (2.5-3.5 mm) than for most taxa of section; the adaxial face nerveless or faintly nerved. Similar to *C. molesta*; spikes less congested, less densely flowered, the terminal often with a prolonged staminate section; mature perigynia appressed-ascending. See Rothrock and Reznicek (2001). Dry fields and open forests. [DE-h, PA, VA, WV]. Rare, WS, PD.

Carex bromoides Willdenow ssp. ***bromoides***
Brome-like Sedge *Deweyanae*
(KM; infraspecific taxa not distinguished — BR, F, GC, H, HS, RB, SC, T)



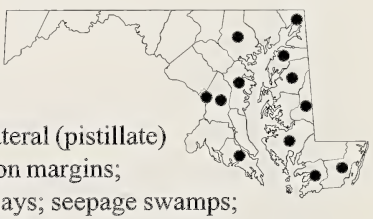
Distinctive sedge with narrow (1.0-2.5 mm), stiff leaves and lance-cylindrical spikes. Perigynium linear-lanceolate, 4 to 5 times as long as wide. See Naczi (1990). Swampy forests; floodplains; seepages. [DE, PA, VA, WV]. Frequent, ES; infrequent, AP, RV, PD, WS.

Carex brunnescens (Persoon) Poiret var. ***sphaerostachya*** (Tuckerman) Kükenthal
Brownish Sedge *Glareosae (Heleonastes)*
(F, KM, SC; infraspecific taxa not distinguished — BR, GC, H, RB; *C. brunnescens* (Persoon) Poiret ssp. *sphaerostachya* (Tuckerman) Kalela)



Similar to *C. canescens*, but with leaves green and narrow (1.0-2.5 mm); mature perigynia brown and loosely spreading. Rocky, usually montane, forests and slopes. [PA, VA, WV]. Rare, AP, PD (disjunct).

Carex bullata Schkuhr *ex* Willdenow
Button Sedge *Vesicariae*
(BR, F, GC, H, HS, KM, RB, T)

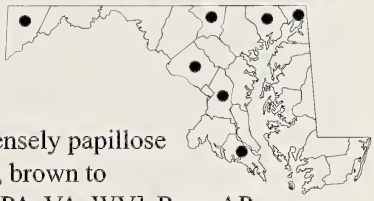


Similar to *C. vesicaria*, but with elongated rhizomes; lateral (pistillate) spikes thicker (10-20 mm); perigynium beak scabrous on margins; distributed primarily on the Coastal Plain. Delmarva Bays; seepage swamps; other non-tidal wetlands. [DE, PA, VA]. Infrequent, WS, ES.

Carex bushii Mackenzie
Bush's Sedge *Porocystis (Virescentes)*
(BR, F, GC, H, HS, KM, RB, SC, T)

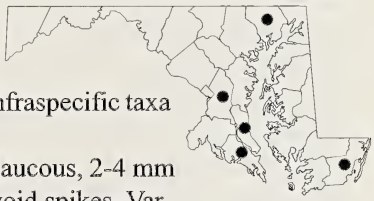
Similar to *C. complanata* and *C. hirsutella*, but with perigynia spreading, not compressed. Similar to *C. caroliniana*, but with leaf sheaths hairy; pistillate scales long-acuminate, exceeding perigynia and interrupting the outline of the spike. Dry fields, meadows, and glades, usually over basic soils. [DE, PA, VA, WV]. Infrequent, PD; rare, WS.

Carex buxbaumii Wahlenberg
Buxbaum's Sedge *Racemosae (Atratae)*
(BR, F, GC, H, HS, KM, RB, SC, T)



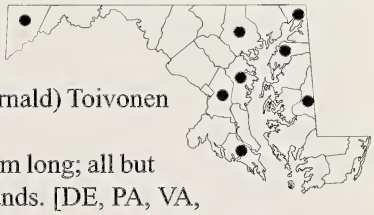
Distinctive sedge, with perigynium nearly beakless, densely papillose (conspicuous with a 10x lens). Pistillate scales aristate, brown to purplish-black, with paler midrib. Seepages; fens. [DE, PA, VA, WV]. Rare, AP, PD, WS.

Carex canescens Linnaeus var. ***canescens***
Silvery Sedge *Glareosae (Heleonastes)*
(BR, F, RB, SC; *C. canescens* ssp. *canescens* — KM; infraspecific taxa not distinguished — GC, H)

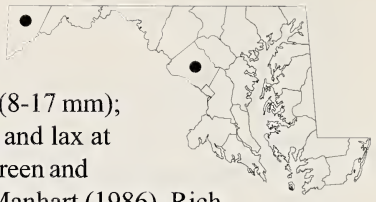


C. canescens is a distinctive sedge, with leaves very glaucous, 2-4 mm wide; perigynia appressed-ascending in ellipsoid or ovoid spikes. Var. *canescens* has the inflorescence 2-7 cm long; spikes approximate or slightly remote. Fens; seepages; other peatlands. [PA, VA, WV]. Infrequent, WS; rare, ES.

Carex canescens Linnaeus var. ***disjuncta*** Fernald
Silvery Sedge *Glareosae (Heleonastes)*
(BR, F, HS, RB, SC, T; *C. canescens* ssp. *disjuncta* (Fernald) Toivonen — KM; infraspecific taxa not distinguished — GC, H)

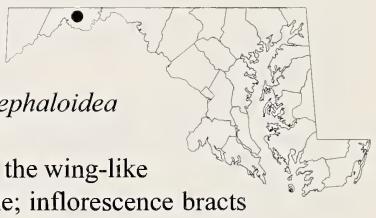


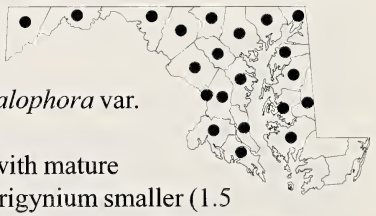
Similar to var. *canescens*, but with inflorescence 6-15 cm long; all but uppermost spikes remote. Fens; seepages; other peatlands. [DE, PA, VA, WV]. Frequent, AP; infrequent, PD-h, WS, ES.

Carex careyana Torrey *ex* Dewey
Carey's Sedge *Careyanae (Laxiflorae)*
(BR, F, GC, H, HS, KM, RB)

Distinctive within section. Leaves evergreen and wide (8-17 mm); basal sheaths conspicuously wine-purple. Culms long and lax at maturity. Perigynium large (5.0-6.5 mm long), yellow-green and sharply trigonous. Staminate scales deep brown. See Manhart (1986). Rich forests, on calcareous or alluvial soils. [PA, VA, WV]. Rare, AP, PD.

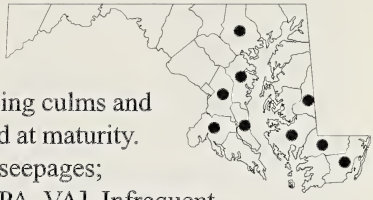
Carex caroliniana Schweinitz
Carolina Sedge *Porocystis (Virescentes)*
(BR, F, GC, H, HS, KM, RB, SC, T)

Similar to *C. bushii*, *C. complanata*, and *C. hirsutella*, but with leaves and leaf sheaths glabrous. Perigynia glabrous, subterete and spreading. Pistillate scales ovate, shorter than the perigynia. Wet swales and meadows; vernal pools; floodplains. [DE, PA, VA, WV]. Infrequent, WS; rare, PD, ES.

Carex cephaloidea (Dewey) Dewey
Thin-leaved Sedge *Phaestoglochin (Bracteosae)*
(BR, F, KM, RB; *C. sparganioides* Muhlenberg var. *cephaloidea* (Dewey) Carey — GC)

Similar to *C. aggregata*, but with culms very rough on the wing-like angles; inner bands of leaf sheaths truncate and friable; inflorescence bracts usually lacking. Rich forests; floodplains. [PA]. Rare, RV-h.

Carex cephalophora Muhlenberg *ex* Willdenow
Oval-leaf Sedge *Phaestoglochin (Bracteosae)*
(BR, F, KM, HS, RB, SC, T; in part only — H; *C. cephalophora* var. *cephalophora* — GC)

Inflorescence capitate. Similar to *C. mesochorea*, but with mature culms equal in length to or barely exceeding leaves; perigynium smaller (1.5 – 2.0 mm wide; 2.0-3.0 mm long); pistillate scales (excluding awns) shorter than the perigynia bodies. Dry forests, barrens, and fields. [DE, PA, VA, WV]. Common, AP, RV, PD, WS; frequent (rare southward), ES.

Carex collinsii Nuttall
Collins' Sedge *Collinsiae*
(BR, F, GC, H, HS, KM, RB, T)



Distinctive sedge, with slender, weak, arching to reclining culms and subulate perigynia that are widely spreading or reflexed at maturity. Perigynium teeth abruptly reflexed. Seepages; Acidic seepages; swamps; floodplain forests; often on *Sphagnum*. [DE, PA, VA]. Infrequent, WS, ES.

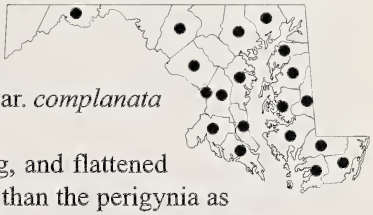
Carex communis Bailey var. ***communis***
Fibrous-root Sedge *Acrocystis (Montanae)*
(KM; infraspecific taxa not distinguished — BR, F, GC, H, HS, RB, SC, T)

Similar to *C. pensylvanica*, but lacking long rhizomes and with wider leaves (3-6 mm wide). Inflorescence bracts with hyaline, auriculate appendages. See Cusick (1992), Rettig and Crins (1996). Rich, dry, often rocky, forests. [DE, PA, VA, WV]. Frequent, RV, PD; infrequent, AP; rare, WS.

Carex comosa F. Boott
Bearded Sedge *Vesicariae (Pseudocypereae)*
(BR, F, GC, H, HS, KM, RB, SC, T)

Distinctive sedge, with cylindrical lateral (pistillate) spikes with reflexed perigynia having curving, divergent teeth, the inflorescence thus appearing bristly. Marshes; seepages; sloughs; swamps; disturbed wetlands. [DE, PA, VA, WV]. Frequent, WS, ES; infrequent, PD; rare, RV (disjunct).

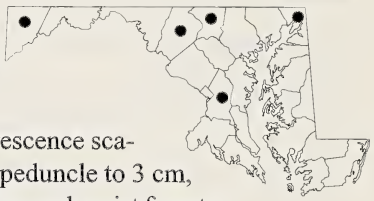
Carex complanata Torrey and Hooker
Flattened Sedge *Porocystis (Virescentes)*
(BR, F, KM, T; in part only — H, HS; *C. complanata* var. *complanata* —GC)



Leaf sheaths pubescent, perigynia glabrous, ascending, and flattened on adaxial face, and pistillate scales ovate and shorter than the perigynia as in *C. hirsutella*, but leaves rigid, keeled, and glabrous to very sparsely pubescent. Mesic to moist forests and clearings. [DE, VA]. Common, WS, ES; infrequent, RV, PD.

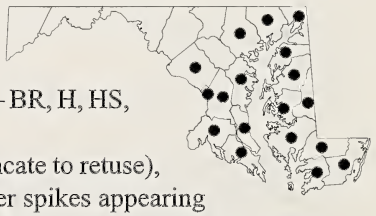
Carex conjuncta F. Boott
Soft Fox Sedge *Vulpinae*
(BR, F, GC, H, HS, KM, RB, SC)

Culms distinctly spongy and wing-angled; spikes compound. Resembles *C. stipata* and *C. laevivaginata*, but perigynium lance-ovate, with shorter beak, half as long as the body or less. See Jones and Reznicek (1995). Moist edges, open forests, floodplains, usually on calcareous soils. [DE, PA, VA, WV]. Infrequent (locally common) RV, PD.

Carex conoidea Schkuhr *ex* Willdenow
Field Sedge *Griseae (Oligocarpae)*
(BR, F, GC, H, KM, RB, SC, T)

Similar to *C. amphibola*, but with the axis of the inflorescence scabrous, the terminal (staminate) spike elevated on long peduncle to 3 cm, and perigynium smaller (2.5-4.0 mm long). Wet meadows and moist forests, usually over basic soils. [DE-h, PA, VA, WV]. Rare, AP, PD, WS.

Carex corrugata Fernald
Prune-fruit Sedge *Griseae (Oligocarpae)*
(F; *C. amphibola* Steudel, in part — GC, KM)

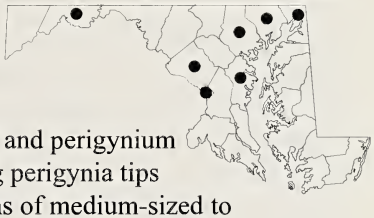
Very similar to *C. amphibola*, but perigynium 1.8-2.3 times as long as wide. Similar to *C. grisea*, but leaves generally narrower (widest less than 5.5 mm wide) stipe generally longer (more than 0.4 mm). The most distinctive feature is the truncate apex of the mature achene. See Naczi (1993). Rich floodplain forests and meadows. [VA]. Infrequent, ES; rare (disjunct), RV, PD. Perhaps overlooked.

Carex crinita Lamarck var. ***brevicrinis*** Fernald
Short-fringed Sedge *Phacocystis (Cryptocarpae)*
(F, GC, KM, RB; infraspecific taxa not distinguished — BR, H, HS, SC, T)

Similar to var. *crinita* (with apex of pistillate scale truncate to retuse), but with perigynia strongly inflated, obovate, the lower spikes appearing more cylindrical and less tapering; achene symmetrical, without invaginations. See Bruederle and Fairbrothers (1986). Wet meadows; swamps; ditches. [DE, PA, VA]. Common, WS, ES; infrequent, PD.

Carex crinita Lamarck var. ***crinita***
Fringed Sedge *Phacocystis (Cryptocarpae)*
(F, GC, KM, RB; infraspecific taxa not distinguished — BR, H, HS, SC, T)

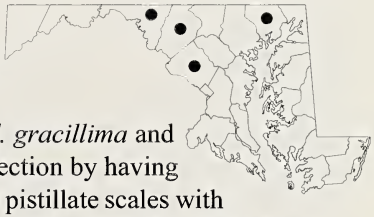
Similar to *C. gynandra*, but with perigynia more inflated, obovate; apex of pistillate scale truncate to retuse. Similar to var. *brevicrinis*, but with perigynia ellipsoid, the lower spikes appearing long-tapering; achene asymmetrical, invaginated on one or both sides. See Standley (1983). Wet meadows; swamps; ditches. [DE, PA, VA, WV]. Common, AP, RV, PD; frequent, WS, ES.

Carex cristatella Britton
Crested Sedge *Ovales*
(BR, F, GC, H, HS, KM, RB, SC, T)



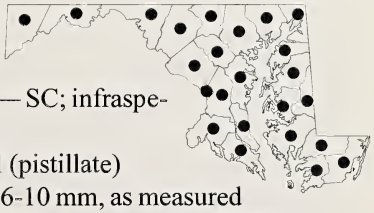
Resembles *C. tribuloides* (with inflorescence crowded and perigynium thin and scale-like), but spikes globose, with recurving perigynia tips hiding scales. Wet meadows; open swamps; floodplains of medium-sized to large rivers. [DE-h, PA, VA, WV]. Rare, RV, PD, WS.

Carex davisii Schweinitz and Torrey
Davis' Sedge *Hymenochlaenae (Gracillimae)*
(BR, F, GC, HS, KM, RB, SC, T)



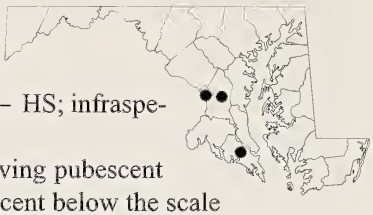
Spikes elongate; terminal spike gynecandrous, as in *C. gracillima* and *C. prasina*. Distinguished from other members of its section by having leaf sheaths hairy, spikes relatively wide (4-6 mm), and pistillate scales with spreading awns. Nutrient-rich floodplain forests and openings. [DE, PA, WV]. Rare, RV, PD.

Carex debilis Michaux var. ***debilis***
White-edged Sedge *Hymenochlaenae (Sylvaticae)*
(BR, F, GC, HS, KM, RB, *C. debilis*, in a narrow sense — SC; infraspecific taxa not distinguished — H, T)



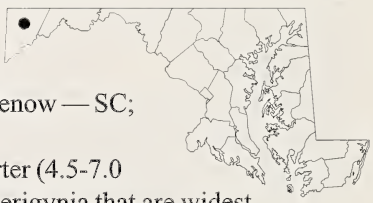
C. debilis is distinctive, with elongate, drooping lateral (pistillate) spikes with fusiform perigynia. Var. *debilis* has longer (6-10 mm, as measured at proximal end of the spike), glabrous perigynia that are widest below the middle, with elongate, distinctly hyaline-tipped beaks. Swamps; moist forests. [DE, PA, VA, WV]. Common, PD, WS, ES; frequent, AP, RV.

Carex debilis Michaux var. ***intercursa*** Fernald
Fernald's White-edged Sedge
Hymenochlaenae (Sylvaticae)
(F, KM; *C. debilis* Michaux var. *pubera* Gray, in part — HS; infraspecific taxa not distinguished — H)
Distinguished from other varieties of *C. debilis* by having pubescent perigynia and pistillate scales with the midribs evanescent below the scale apex. Recent research (M. Waterway, pers. comm.) suggests that forms of *C. debilis* with pubescent perigynia are not taxonomically distinct. See Fernald (1942). Swamps; moist forests. [VA]. Rare, WS.

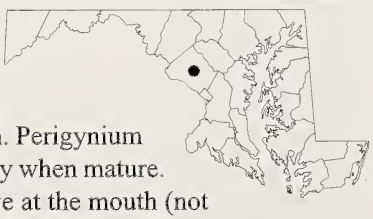


Carex debilis Michaux var. ***pubera*** Gray
Allegheny Sedge *Hymenochlaenae (Sylvaticae)*
(BR, F, GC, KM, RB; in part only — HS; *C. allegheniensis* Mackenzie; infraspecific taxa not distinguished — H)
Distinguished from other varieties of *C. debilis* by having pubescent perigynia and pistillate scales with the midribs generally excurrent. Recent research (M. Waterway, pers. comm.) suggests that forms of *C. debilis* with pubescent perigynia are not taxonomically distinct from var. *debilis* or var. *rudgei*. Dry to mesic upland forests. [PA, VA]. Rare, AP, RV-h, PD.

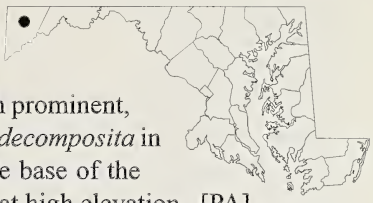
Carex debilis Michaux var. ***rudgei*** Bailey
Rudge's Sedge *Hymenochlaenae (Sylvaticae)*
(BR, F, GC, KM, RB; *C. flexuosa* Muhlenberg *ex* Willdenow — SC; infraspecific taxa not distinguished — H)
Differs from other varieties of *C. debilis* in having shorter (4.5-7.0 mm, as measured at proximal end of spike), glabrous perigynia that are widest near the middle with short beaks that are slightly or not hyaline-tipped. Northern hardwoods, hemlock forests. [PA, VA, WV]. Frequent, AP.



Carex decomposita Muhlenberg
Cypress-knee Sedge *Heleoglochin (Paniculatae)*
(BR, F, GC, H, HS, KM)
Inflorescence compound, with many spikes per branch. Perigynium obovoid, with short (0.5 mm) beak, olive to black, shiny when mature. Differs from *C. diandra* in having leaf sheaths concave at the mouth (not prolonged) and in range and habitat. Woodland pools. [DE, VA]. Rare, PD-h.



Carex diandra Schrank
Lesser Panicled Sedge *Heleoglochin (Paniculatae)*
(F, GC, KM, RB)



Inflorescence compound. Perigynium lance-ovate, with prominent, serrulate-margined beak to 1 mm long. Differs from *C. decomposita* in having leaf sheaths distinctively prolonged beyond the base of the leaf blade and in range and habitat. Minerotrophic fen at high elevation. [PA]. Rare (single station), AP. Disjunct from the glaciated Northeast.

Carex digitalis Willdenow var. ***digitalis***
Northern Slender Woodland Sedge *Careyanae (Laxiflorae)*
(BR, F; infraspecific taxa not distinguished — GC, H, HS, KM, RB, SC, T).

Leaves green, narrower (2.7-4.5 mm) than in most taxa in section. Perigynium trigonous, 2.5-3.3 mm long. Pistillate scales acuminate to awned. Terminal (staminate) spike with short (usually < 7 cm) peduncle, usually surpassed by uppermost lateral spike bract. See Manhart (1986), Naczi et al. (2001). Dry to mesic forests. [DE, PA, VA, WV]. Common, RV, PD, WS; frequent, AP; infrequent (rare southward), ES.

Carex digitalis Willdenow var. ***macropoda*** Fernald
Southern Slender Woodland Sedge
Careyanae (Laxiflorae)
(BR, F; infraspecific taxa not distinguished — GC, H, HS, KM, T).

Similar to var. *digitalis*, but leaves narrower (2.0-2.9 mm). Terminal spike long-peduncled (8-16 cm), usually exceeding the uppermost lateral bract). See Fernald (1938), Naczi et al. (2001). Nutrient-rich, mesic to dry forests. [VA]. Rare, PD, ES. Some authors question its taxonomic distinctiveness (see Manhart, 1986).

Carex distans Linnaeus
Distant-flowered Sedge *Spirostachyae (Extensae)*
(KM)

Distinctive cespitose sedge, with gray-green leaves, the terminal spike staminate, and two to three widely-spaced lateral (pistillate) spikes on peduncles 1-4 cm long. Perigynium flask-shaped, with prominent ribs and rough-edged beak. See Tutin et al. (1980), Jermy et al. (1982). Damp meadow; in Europe, also brackish marshes and coasts. [none]. Locally naturalized or adventive (European) (single collection), WS-h.

Carex divisa Hudson
Divided Sedge *Divisae*
(BR, F, GC, H, KM)

Colonial sedge with coarse rhizomes with blackish scales. Leaves narrow (1-3 mm). Spikes elongate, androgynous or entirely pistillate. Pistillate scales brownish, largely concealing the perigynia. See Jermy et al. (1982). Salt marshes. [VA]. Locally naturalized or adventive (European), WS.

Carex divulsa Stokes
Gray Sedge *Phaestoglochin (Bracteosae)*
(BR, F, GC, KM, RB)

Similar to *C. spicata* and *C. muricata*, with spicate inflorescence and pistillate scales often strongly tinged with brown or reddish purple. Basal sheaths brown to blackish (not purple-tinged, as in *C. spicata*). Perigynia appressed-ascending (not spreading, as in *C. muricata*), tapered at ends. See Jermy et al. (1982). Disturbed sites; lawns. [PA]. Locally naturalized or adventive (European) (single collection), WS-h.

Carex eburnea F. Boott
Ebony Sedge *Albae*
(F, GC, H, KM, RB, SC)

Distinctive sedge, cespitose from slender rhizomes, with wiry, capillary culms and involute, filiform leaves that are less than 2 mm wide. Terminal spike staminate, sessile to subsessile, overtopped by two uppermost lateral (pistillate) spikes. Inflorescence few-fruited; mature perigynium olive to black. Rocky, calcareous slope. [PA, VA, WV]. Rare (single station), RV.

Carex echinata Murray ssp. ***echinata***
Prickly Sedge *Stellulatae*
(KM; *C. echinata* var. *echinata* — GC; infraspecific taxa not distinguished — RB; *C. angustior* Mackenzie — BR, F, HS, SC, T; *C. cephalantha* (Bailey) Bicknell — BR, F; *C. laricina* Mackenzie — SC; *C. muricata* Linnaeus, misapplied — H)

Similar to *C. atlantica* and *C. interior*, but with longer (0.95-2.00 mm) perigynium beak. See Reznicek and Ball (1980). Fens; seepages. [PA, VA, WV]. Infrequent, AP; rare (disjunct), PD, WS-h.

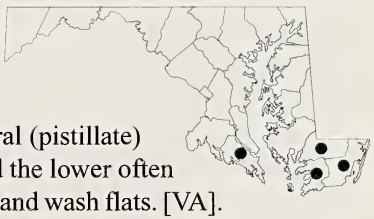
Carex emoryi Dewey
Emory's Sedge *Phacocystis (Acutae)*
(BR, F, GC, HS, KM, RB, SC, T)

Resembles *C. stricta*; more robust; lower leaf sheaths not fibrillose; summit of leaf sheaths convex; lateral (pistillate) spikes generally longer and more overlapping; perigynium obovate, with granular papillae restricted to apex. See Standley (1989). Rocky banks of large rivers; rarely, river swamps. [DE, PA, VA, WV]. Infrequent, RV, PD (locally common). Mostly along Potomac River.

Carex exilis Dewey
Coast Sedge *Stellulatae*
(BR, F, GC, KM, T)

Involute leaves and solitary terminal spikes (that are either staminate, pistillate, or gynecandrous, with the staminate part prolonged and clavate) distinguish this species from other members of its section. See Reznicek and Ball (1980). Atlantic white cedar swamp. [DE]. Rare (single station), WS.

Carex extensa Goodenough
Long-bracted Sedge *Spirostachyae (Extensae)*
(BR, F, GC, H, KM)

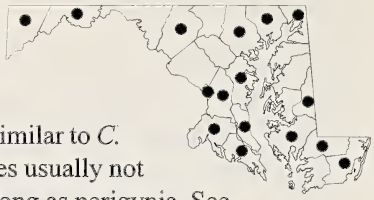


Leaves involute. Inflorescence bracts sheathless. Lateral (pistillate) spikes thick-cylindrical; the upper subapproximate and the lower often remote. See Jermy et al. (1982). Salt marshes; barrier island wash flats. [VA]. Locally naturalized (European) (coastal), WS, ES.

Carex festucacea Schkuhr *ex* Willdenow
Fescue Sedge *Ovales*
(BR, F, GC, H, HS, KM, RB, SC, T)

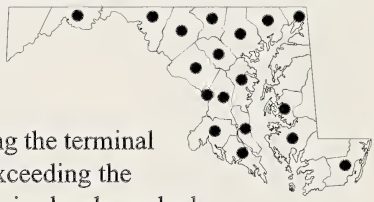
Similar to several other members of section; spikes usually well separated, often with prolonged, tapering staminate bases. Body of perigynium orbicular with abrupt transition to beak, fairly prominently nerved on abaxial face; nerves 3 or fewer on adaxial face. See Rothrock (1991). Moist fields, meadows, and open forests. [DE, PA, WV, VA]. Frequent, PD, WS, ES; rare, RV.

Carex folliculata Linnaeus
Northern Long Sedge *Rostrales (Folliculatae)*
(HS, KM, RB, SC; in part only — H, T; *C. folliculata* var. *folliculata* — BR, F, GC)



Distinctive sedge with inflated, lanceolate perigynia. Similar to *C. lonchocarpa*, but leaves wider (6-16 mm); lateral spikes usually not staminate at the tips; pistillate scales 0.5-1.2 times as long as perigynia. See Wujek and Menapace (1986). Seepages; fens; other acidic wetlands. [DE, PA, VA, WV]. Common, AP; frequent, WS; infrequent, RV, PD, ES.

Carex frankii Kunth
Frank's Sedge *Squarrosae*
(BR, F, GC, H, HS, KM, RB, SC, T)

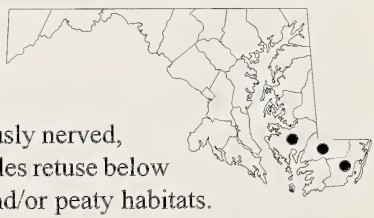


Distinguished from other members of section by having the terminal spike staminate and the awns of the pistillate scales exceeding the perigynia. Lateral (pistillate) spikes cylindrical; perigynia closely packed, abruptly beaked, the bodies obovate. Open, often disturbed, wetlands; ditches; floodplains. [DE, PA, WV, VA]. Common, RV, PD, WS; infrequent (perhaps adventive), ES.

Carex gigantea Rudge
Giant Sedge *Lupulinae*
(BR, F, GC, H, KM, T)

Similar to *C. lupulina* and *C. lupuliformis*. Often with multiple (2-5) staminate spikes. Perigynia abruptly narrowed to long, horizontally divergent beaks, 2-4 times as long as the bodies. Achene rhombic, broader than long; summit truncate; faces concave; angles thickened. See Reznicek and Ball (1974). Seasonal ponds; swamp forests; floodplains. [DE, VA]. Infrequent, ES; rare, WS.

Carex glaucescens Elliott
Southern Waxy Sedge *Pendulinae*
(BR, F, GC, H, KM, T)



Similar to *C. joorii*, but with perigynium inconspicuously nerved, glaucous, little inflated, 2.8-3.5 mm long; pistillate scales retuse below the awn. Moist areas in pine woodlands; wet, acid, and/or peaty habitats. [VA]. Rare, ES.

Carex glaucodea Tuckerman *ex* Olney
Blue Sedge *Griseae (Oligocarpae)*
(BR, HS, RB, SC, T; *C. flaccosperma* Dewey var. *glaucodea* (Tuckerman) Kükenthal — F, KM; *C. flaccosperma* Dewey, in part — GC, H)

Distinctive within section; leaves glaucous; perigynium plump and beakless; pistillate scales awnless or short-awned. See Naczi (1997). Rich, often basic, forests and meadows; serpentine. [DE, PA, VA, WV]. Frequent, PD, WS; infrequent, RV, ES.

Carex gracilescens Steudel
Slender Loose-flowered Sedge *Laxiflorae*
(BR, F, GC, H, KM, RB, SC, T; *C. laxiflora* Lamarck, misapplied — HS)

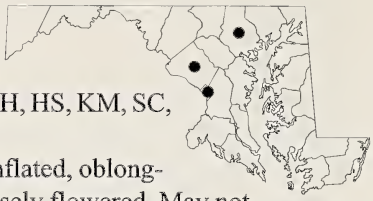
Perigynium beak abruptly bent, as in *C. blanda*, but often longer and arching. Further distinguished from *C. blanda* by purple basal sheaths (often obscure to absent in weathered specimens). Terminal (staminate) spike well elevated above upper lateral (pistillate) spikes. See Manhart (1986). Rich forests; floodplains of medium-sized streams. [DE, PA, VA, WV]. Frequent, RV, PD; rare, AP, WS.

Carex gracillima Schweinitz
Graceful Sedge *Hymenochlaenae (Gracillimae)*
(BR, F, GC, H, HS, KM, RB, SC, T)

A frequently encountered member of a group of sedges with gynecandrous terminal spikes and long, narrow pistillate lateral spikes. Basal sheaths purple; leaf sheaths glabrous on ventral sides. Perigynium obtusely angled, beakless. Mesic forests; floodplains. [DE, PA, VA, WV]. Common, AP; frequent, RV, PD; infrequent, WS; rare, ES.

Carex granularis Muhl. *ex* Willd. var. ***granularis***
Limestone Meadow Sedge *Granulares*
(F, RB; infraspecific taxa not distinguished — BR, GC, H, HS, KM, SC, T)

Distinctive sedge, with leaves somewhat glaucous. Terminal spike staminate, sessile to short-peduncled. Lateral spikes pistillate and cylindrical, with closely packed subglobose perigynia with short, but distinct, beaks. Rich, often open, floodplains; minerotrophic fens. [DE, PA, VA, WV]. Infrequent, AP, RV, PD; rare, WS, ES.

Carex granularis Muhlenberg *ex* Willdenow
var. ***haleana*** (Olney) Porter
Hale's Sedge *Granulares*
(F, RB; infraspecific taxa not distinguished — BR, GC, H, HS, KM, SC, T; *C. haleana* Olney)

Similar to var. *granularis*, but perigynium much less inflated, oblong-ellipsoid; lateral (pistillate) spikes appearing more densely flowered. May not be taxonomically distinct, as specimens intermediate with var. *granularis* occur. Rich, often open, floodplains, usually with var. *granularis*. [PA]. Rare, PD.

Carex gravida Bailey var. ***lunelliana*** (Mackenzie) Hermann
Heavy Sedge *Phaestoglochin (Bracteosae)*
(F, GC, KM)

Similar to *C. aggregata*, but perigynia brownish-yellow at maturity and pistillate scales with a slender tip, surpassing the base of the perigynium beak. Dry meadow. [VA]. Locally adventive (from midwestern United States) (single station), WS.

Carex grayi Carey
Asa Gray's Sedge *Lupulinae*
(GC, H, KM, RB; *C. grayii*, an orthographic error — BR, F, SC)

Similar to *C. intumescens*, but lateral (pistillate) spikes globose, with perigynia radiating in all directions, with their bases rhombic, rather than rounded. Most of our plants have hispidulous perigynia (var. *hispidula* Gray, a dubious taxon). See Reznicek and Ball (1974). Floodplain forests. [PA, VA, WV]. Infrequent (locally common), RV, PD, WS; rare, ES.

Carex grisea Wahlenberg
Inflated Narrow-leaf Sedge *Griseae (Oligocarpae)*
(RB, HS, T; *C. amphibola* Steudel var. *turgida* (Bailey) Fernald — BR, F, KM, SC; *C. amphibola* Steudel, in part — GC, H)

Similar to *C. amphibola* and *C. corrugata*. Perigynia spirally imbricate, conspicuously inflated, rounded in cross section, 1.8-2.3 times as long as wide; summit of achene rounded; achene stipe usually less than 0.4 mm long. See Naczi (1993). Floodplain forests and meadows. [DE, PA, VA, WV]. Frequent, RV, PD; rare, WS.

Carex gynandra Schweinitz
Nodding Sedge *Phacocystis (Cryptocarpae)*
(BR, GC, HS, KM, RB, SC, T; *C. crinita* Lamarck var. *gynandra* (Schweinitz) Schweinitz and Torrey — F; *C. crinita*, in part — H)

Similar to vars. of *C. crinita*, but perigynium barely inflated, ellipsoid; apex of pistillate scale acute. Achenes invaginated on one or both sides. See Standley (1983), Bruederle and Fairbrothers (1986). Wet meadows; swamps; ditches. [DE, PA, VA, WV]. Common, AP; infrequent, RV-h, PD; rare, WS.

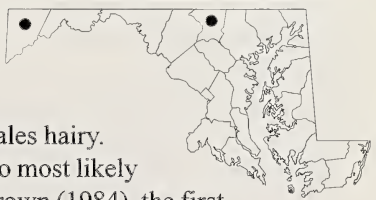
Carex haydenii Dewey
Cloud Sedge *Phacocystis (Acutae)*
(F, GC, KM, RB; *C. stricta* Lamarck var. *decora* Bailey — T)

Similar to *C. stricta*, but with lower leaf sheaths not fibrillose; perigynium inflated, red-green, without nerves or papillae; pistillate scales acuminate, longer than the perigynia. See Standley (1989). Minerotrophic fen, with *C. stricta*, at high elevation. [PA]. Rare (single station), AP.

Carex hirsutella Mackenzie
Hirsute Sedge *Porocystis (Virescentes)*
(BR, F, KM, RB, SC, T; *C. complanata* Torrey and Hooker var. *hirsuta* (Bailey) Gleason — GC; *C. complanata* Torrey, in part — H, HS)

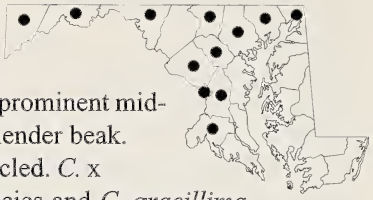
Similar to *C. complanata*, but leaves flat, soft, and moderately to densely pubescent. Dry forests, fields, and meadows. [DE, VA, WV]. Common, RV, PD; frequent, WS; rare, AP, ES.

Carex hirta Linnaeus
Hammer Sedge *Carex (Hirtae)*
(BR, F, GC, KM, RB)

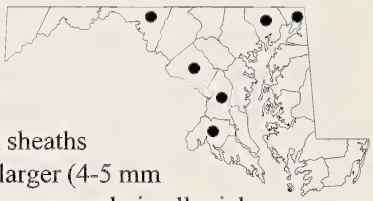


Vigorously rhizomatous. Leaf sheaths and pistillate scales hairy. Although reported for Maryland by Shreve (1910) (who most likely misapplied the name to *C. hirtifolia*) and Brown and Brown (1984), the first Maryland specimen seen was collected in 1998. See Jermy et al. (1982). Roadside; disturbed sites. [PA]. Locally naturalized or adventive (European), AP, PD (planted at residence).

Carex hirtifolia Mackenzie
Pubescent Sedge *Halleranae (Triquetrae)*
(BR, F, GC, H, HS, KM, RB, SC, T)
Distinctive sedge. Leaves soft and lax, hairy, with two prominent mid-lateral veins. Perigynium pubescent, trigonous, with slender beak. Terminal (staminate) spike pale, sessile or short-peduncled. *C.* x *sullivantii* Boott, a purported hybrid between this species and *C. gracillima*, occurs in Garrett County. Rich, dry to mesic forests, often in stream valleys. [DE, PA, VA, WV]. Frequent, PD; rare, AP, RV-h, WS.

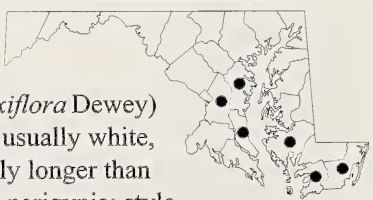


Carex hitchcockiana Dewey
Hitchcock's Sedge *Griseae (Oligocarpae)*
(BR, F, GC, H, HS, KM, RB, SC)
Similar to *C. oligocarpa*; leaves wider (3-7 mm); basal sheaths brownish; upper leaf sheaths hispidulous; perigynium larger (4-5 mm long). Upland forests, on calcareous or mafic soils; less commonly in alluvial forests. [PA, VA, WV]. Rare, RV, PD, WS.



Carex hormathodes Fernald
Marsh Straw Sedge *Ovales*
(BR, F, KM, T; *C. straminea* Willdenow *ex* Schkuhr var. *invisa* W. Boott — GC; *C. straminea*, in part — H)
Pistillate scales awned. Similar to *C. straminea*, but with inflorescence nodding; staminate bases of lateral spikes up to 3 mm long; perigynia more ascending, with gradually tapering beaks that are 1/3 to 3/5 as long as the lance-ovate bodies. See Rothrock et al. (1997). Brackish to salt marshes, often with *Spartina patens*. [DE, VA]. Infrequent (coastal), WS, ES.

Carex hyalinolepis Steudel
Shoreline Sedge *Paludosae*
(BR, F, GC, H, KM, RB; *C. lacustris* Willdenow var. *laxiflora* Dewey)
Similar to *C. lacustris*, but phyllopodic; basal sheaths usually white, not fibrillose; foliage glaucous; ligule shorter to slightly longer than wide; pistillate scales with awns equal in length to the perigynia; style straight. Fresh to slightly brackish tidal marshes (often in large stands); swamp forests. [PA-h, VA]. Infrequent (locally common), ES (rarer northward); rare, WS.



Carex hystericina Muhlenberg *ex* Willdenow
Porcupine Sedge *Vesicariae (Pseudocypereae)*
(GC, H, HS, KM, RB; *C. hystricina*, an orthographic variant — BR, F, SC)

Similar to *C. lurida*, but with lateral (pistillate) spikes drooping on short to long, fine peduncles. Perigynium less inflated than in *C. lurida*, and has more (15-20) and more prominent nerves. Wet meadows on basic soils; serpentine. [PA, VA, WV]. Rare, PD.

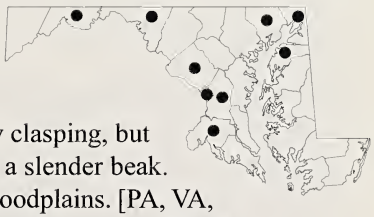
Carex interior Bailey
Inland Sedge *Stellulatae*
(BR, F, GC, H, HS, KM, RB, SC, T)

Similar to, and often confused with, *C. atlantica* ssp. *atlantica*. Perigynium with prominently setose-serrulate beak, nerveless adaxial surface, with nearly straight sides that form subtle "shoulders" below the beak. See Reznicek and Ball (1980). Seepages over serpentine. [PA, VA, WV]. Rare, PD. Much less frequent in state than has been previously suggested.

Carex intumescens Rudge
Greater Bladder Sedge *Lupulinae*
(BR, F, GC, H, HS, KM, RB, SC, T)

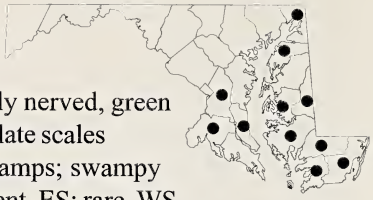
Similar to *C. grayi*, but perigynia mostly ascending to spreading. May resemble *C. louisianica*, but has inner sides of the perigynium teeth hispid, achenes ellipsoid to obovoid. Brown and Brown (1984) report var. *fernaldii* Bailey, a dubious taxon, with perigynia barely inflated. See Reznicek and Ball (1974). Seasonal ponds, floodplains, swamps, seepages. [DE, PA, VA, WV]. Common, PD, WS, ES; frequent, AP, RV.

Carex jamesii Schweinitz
James' Sedge *Phyllostachyae*
(BR, F, GC, H, HS, KM, RB, SC)



Similar to *C. willdenowii*, with staminate scales tightly clasping, but with perigynium body globose, abruptly contracted to a slender beak. See Catling et al. (1993). Forests on calcareous soils; floodplains. [PA, VA, WV]. Frequent, RV; infrequent (locally common, mostly along Potomac and Susquehanna Rivers), PD, WS; rare, ES.

Carex joorii Bailey
Joor's Sedge *Pendulinae*
(BR, F, GC, H, KM, T)

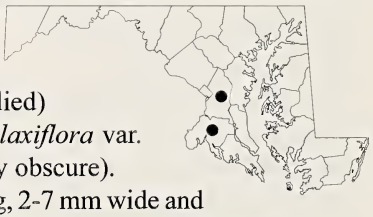


Similar to *C. glaucescens*, but with perigynium strongly nerved, green (brown when mature),well inflated, 4-5 mm long; pistillate scales gradually tapering or rounded to the awn. Cypress swamps; swampy meadows; edges of Delmarva Bays. [DE, VA]. Infrequent, ES; rare, WS.

Carex kobomugi Ohwi
Asiatic Sand Sedge *Macrocephalae*
(BR, F, GC, H, KM)

Coarse, strongly rhizomatous and colonial, dune-forming sedge. Dioecious; leaves serrulate. Flowering plants have not yet been found in Maryland. An invasive species. See Small (1954). Though reported by Brown and Brown (1984), first known Maryland collection was in 1999. Barrier island beaches and dunes. [DE, VA]. Locally naturalized (from eastern Asia) in coastal areas, ES.

Carex species 1
A Sedge *Laxiflorae*
(*C. laxiflora* Lamarck var. *serrulata* Hermann, misapplied)

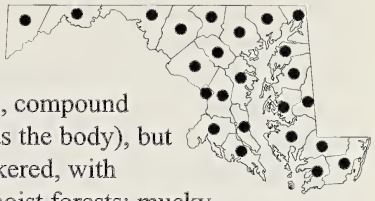


An undescribed species that has been assigned to *C. laxiflora* var. *serrulata* (a different taxon whose identity is presently obscure). Uppermost inflorescence bract spathe-like (3-7 cm long, 2-7 mm wide and concealing uppermost lateral (pistillate) spikes when viewed from abaxial surface). Upper lateral spikes congested as in *C. blanda*; perigynium shape similar to that of *C. laxiflora*. See *C. laxiflora* var. *serrulata* in Reznicek and Gonzalez-Elizondo (1999). Floodplain or mesic forests. [VA]. Rare, WS.

Carex lacustris Willdenow
Lake-bank Sedge *Paludosae*
(BR, F, GC, H, HS, KM, RB, SC; *C. riparia* W. Curtis var. *lacustris* (Willdenow) Kükenthal — T)

Similar to *C. hyalinolepis*, but aphyllopodic; basal sheaths pink to deep red, fibrillose; foliage green; ligule much longer than wide; pistillate scales, including awns, generally shorter than the perigynia; style bent. Perigynia 5.5-7.0 mm long. Swamp forests; marshes; fens. [DE, PA, VA, WV]. Infrequent, WS, ES; rare, AP.

Carex laevivaginata (Kükenthal) Mackenzie
Smooth-sheathed Sedge *Vulpinae*
(BR, F, GC, H, HS, KM, RB, SC, T)

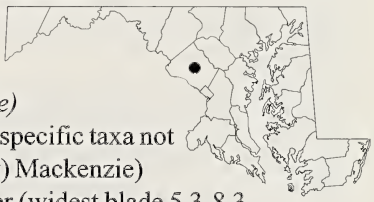


Similar to *C. stipata* (with spongy, sharp-angled culms, compound inflorescence, and beak of perigynium about as long as the body), but with inner band of leaf sheaths smooth, not cross-puckered, with cartilaginous-thickened summit. Swamps; seepages; moist forests; mucky soils. [DE, PA, VA, WV]. Common RV, PD, WS, ES; frequent, AP.

Carex lasiocarpa Ehrhart var. ***americana*** Fernald
Many-fruited Sedge *Paludosae (Hirtae)*
(BR, F, GC, KM, RB; *C. lasiocarpa*, in part only — H)

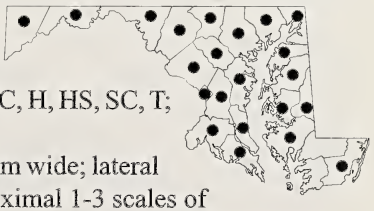
Perigynia pubescent. Similar to *C. pellita*, but with leaves narrower (0.5-2.0 mm) and involute. See McClintock and Waterway (1994) for discussion of nomenclature. Minerotrophic fen at high elevation. [PA, VA, WV-h]. Rare (single station), AP.

Carex laxiculmis Schweinitz var. ***copulata*** (Bailey) Fernald
Coupled Sedge *Careyanae (Laxiflorae)*
(KM, RB; *C.* x *copulata* (Bailey) Mackenzie — F; infraspecific taxa not distinguished — BR, GC, H, SC, T; *C. copulata* (Bailey) Mackenzie)



Similar to var. *laxiculmis*, but leaves green and narrower (widest blade 5.3-8.3 mm wide) and terminal (staminate) spike shorter (longest per plant 0.6-2.0 mm long. See Manhart (1986), Naczi et al. (2001). Nutrient-rich, sandy alluvial forests. [PA, VA]. Rare (single station), PD.

Carex laxiculmis Schweinitz var. ***laxiculmis***
Lax-culmed Sedge *Careyanae (Laxiflorae)*
(KM, RB; infraspecific taxa not distinguished — BR, GC, H, HS, SC, T; *C. laxiculmis*, in a narrow sense — F)



Distinctive within section. Leaves glaucous, 6.4-11.8 mm wide; lateral spikes on slender peduncles (the lowest drooping); proximal 1-3 scales of lateral spikes staminate or empty; perigynium sharply trigonous. Longest terminal (staminate) spike 1.2-2.5 cm long. See Manhart (1986), Naczi et al. (2001). Rich, mesic forests. [DE, PA, VA, WV]. Common, RV, PD; frequent, WS; infrequent, AP, ES (rare southward).

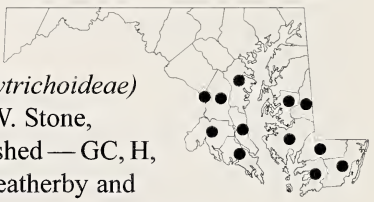
Carex laxiflora Lamarck
Loose-flowered Sedge *Laxiflorae*

(BR, GC, H, RB, SC, T; *C. laxiflora* var. *laxiflora*, in a narrow sense — F, KM; *C. anceps* Muhlenberg — HS)
Leaf width variable (3.5-10.0 mm). Similar to *C. striatula*, but lateral (pistillate) spikes narrower (2.0-3.0 mm); perigynium smaller (3.0-4.5 mm long), with obovoid body and straight to slightly oblique, slender beak. See Manhart (1986). Rich forests, often on bare soil of banks or slopes. [DE, PA, VA, WV]. Frequent, RV, PD, WS; infrequent, AP, ES (rare southward).

Carex leavenworthii Dewey
Leavenworth's Sedge *Phaestoglochin (Bracteosae)*

(BR, F, GC, H, HS, KM, RB, SC, T)
Similar to *C. cephalophora*, but leaves narrower (1-3 mm), perigynium body cordate-deltoid, widest at or near the base. Dry to moist meadows; fields; pastures; somewhat weedy. [DE, PA, VA, WV]. Evidently locally naturalized (from southern United States) (Mackenzie 1931), RV, PD, WS, ES.

Carex leptalea Wahlenberg ssp. ***harperi*** (Fernald) W. Stone
Harper's Bristle-stalked Sedge *Leptocephalae (Polytrichoideae)*



(KM; *C. leptalea* Wahlenberg var. *harperi* (Fernald) W. Stone, misapplied — BR, F, T; infraspecific taxa not distinguished — GC, H, HS; *C. leptalea* Wahlenberg var. *harperi* (Fernald) Weatherby and Griscom; *C. harperi* Fernald)
Similar to ssp. *leptalea*; perigynia longer (3.5-5.0 mm), more narrowly ellipsoid, and more strongly overlapping; the staminate portion of spike more obscured by the perigynia. Southern expression of the species. Seepages, often on *Sphagnum*, floodplains. [DE, VA]. Infrequent, WS, ES.

Carex leptalea Wahlenberg ssp. ***leptalea***
Bristle-stalked Sedge *Leptocephalae (Polytrichoideae)*

(KM; *C. leptalea* var. *leptalea* — BR, F, T; infraspecific taxa not distinguished – GC, H, HS, RB, SC)
Small, distinctive sedge, with narrow (0.5-1.3 mm) leaves and spikes solitary on culms. Similar to ssp. *harperi*; perigynia shorter (2.5-3.5 mm) and more broadly ellipsoid; staminate portion of spike more prominent. Northern expression of the species. Seepages; edges of fens; usually on *Sphagnum*. [DE, PA, VA, WV]. Frequent, AP; infrequent, RV, PD.

Carex leptonervia (Fernald) Fernald
Finely-nerved Sedge *Laxiflorae*
(BR, F, GC, H, KM, RB, SC)

Appears much like *C. laxiflora* and other members of section. Perigynium with convex sides and prominent midrib, but otherwise faintly nerved to nerveless. Wet to mesic soil in northern hardwood forests. [PA, VA, WV]. Frequent, AP; rare, RV (disjunct). Perhaps overlooked.

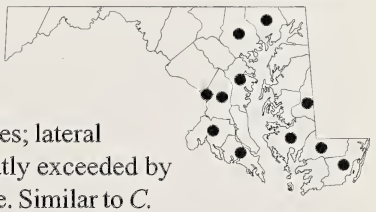
Carex lonchocarpa Willdenow *ex* Sprengel
Southern Long Sedge *Rostrales (Folliculatae)*
(KM; *C. folliculata* Linnaeus var. *australis* (Bailey) Fernald — BR, F, GC, T; *C. folliculata* Linnaeus, in part — H)

Similar to *C. folliculata*, but with narrower (3.5-10.0 mm) leaves; lateral spikes normally staminate at tips; pistillate scales 0.3-0.5 times as long as perigynia. See Wujek and Menapace (1986). Swamps; floodplain forests; seepages. [DE, VA]. Frequent (less so northward), ES.

Carex longii Mackenzie
Long's Sedge *Ovales*
(BR, F, GC, KM, RB, T; *C. albolutescens* Schweinitz, misapplied — HS; in part — H)

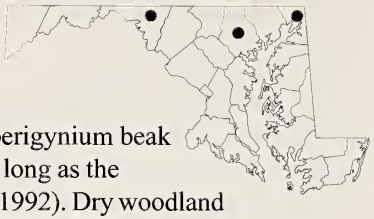
Similar to *C. albolutescens* (with perigynium body widest above middle), but with perigynium beak stouter, more broadly deltoid; style straight. See Rothrock (1991). May hybridize with *C. alata*. Open, dry to (usually) moist, sandy soils; ditches. [DE, PA, VA, WV]. Common, ES; frequent, WS; rare, PD-h.

Carex louisianica Bailey
Louisiana Sedge *Lupulinae*
(BR, F, GC, H, HS, KM)

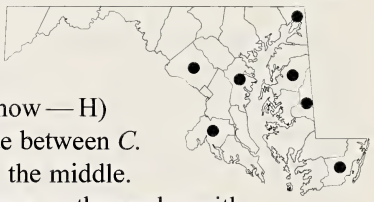


Similar to *C. lupulina*, but with narrower (3-6 mm) leaves; lateral (pistillate) spikes short-cylindrical, the uppermost greatly exceeded by the long-peduncled (3-10 cm) terminal (staminate) spike. Similar to *C. intumescens*, but inner sides of perigynium teeth smooth and achenes rhombic. See Reznicek and Ball (1974). Floodplain forests; swamps. [VA]. Infrequent (locally common), WS, ES.

Carex lucorum Willdenow *ex* Link var. ***lucorum***
Blue Ridge Sedge *Acrocystis (Montanae)*
(KM; infraspecific taxa not distinguished — GC, RB, SC; *C. pensylvanica* Lamarck var. *distans* Peck — F)
Similar to *C. pensylvanica*, but with culms scabrous; perigynium beak longer (1.0-1.5 mm), two-thirds as long as to nearly as long as the body. See Crins and Ball (1983), Rettig (1989), Cusick (1992). Dry woodland openings; barrens. [VA, PA, WV]. Rare, RV-h, PD-h. Perhaps overlooked.



Carex lupuliformis Sartwell
False Hop Sedge *Lupulinae*
(BR, F, GC, KM, RB, T; included in *C. lupulina* Willdenow — H)
Perigynia ascending to slightly spreading (intermediate between *C. lupulina* and *C. gigantea*). Style strongly contorted in the middle. Achenes rhombic, as long as broad, faces strongly concave, the angles with prominent, nipple-like knobs. See Reznicek and Ball (1974). Seasonal ponds; swamps. [DE, PA, VA, WV]. Rare, PD, WS, ES.



Carex lupulina Muhlenberg *ex* Willdenow
Hop Sedge *Lupulinae*
(BR, F, GC, HS, KM, RB, SC, T; in part only — H)
Lateral (pistillate) spikes cylindrical, with strongly ascending perigynia. Style strongly contorted near the base. Achenes rhombic, longer than broad, faces flat to shallowly concave, angles thickened. Terminal (staminate) spike short-peduncled (0.5-6.0 cm), shorter than to slightly exceeding upper lateral spikes. See Reznicek and Ball (1974). Swamps; ditches; pond edges. [DE, PA, VA, WV]. Common, RV, PD, WS, ES; infrequent, AP.

Carex lurida Wahlenberg
Yellow-green Sedge *Vesicariae (Pseudocypereae)*
(BR, F, GC, HS, KM, RB, SC, T)
Pistillate scales with slender, serrulate awns equal in length to or longer than scale body. Similar to *C. baileyi*, but leaves wider (4-7 mm); lateral (pistillate) spikes thicker (> 14 mm wide in mature specimens); perigynium less abruptly contracted to beak. Various wet, usually open, and, often, disturbed habitats. [DE, PA, VA, WV]. Common throughout.

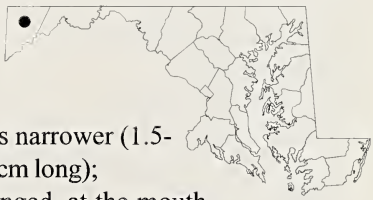
Carex meadii Dewey
Mead's Sedge *Paniceae*
(BR, F, GC, H, KM, RB, SC, T)

Rhizomatous sedge, similar to *C. tetanica*, but leaves gray-green (not green); lateral (pistillate) spikes thicker (5-7 mm), with 6 rows of perigynia. Woodland openings over basic soils (diabase, serpentine). [DE, PA, VA, WV-h]. Rare, PD.

Carex mesochorea Mackenzie
Midland Sedge *Phaestoglochin (Bracteosae)*
(BR, F, HS, KM, RB, SC, T; *C. cephalophora* Muhlenberg var. *mesochorea* (Mackenzie) Gleason — GC; *C. cephalophora*, in part — H)

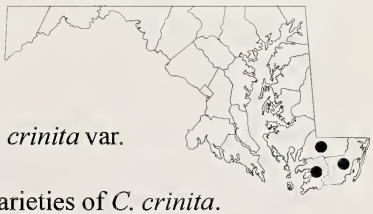
Similar to *C. cephalophora*, but with mature culms greatly exceeding leaves; perigynium larger (2.0 – 2.5 mm wide; 3.0-3.5 mm long); pistillate scales (excluding awns) as long as to longer than the perigynia bodies. Dry forests and fields. [DE, PA, VA, WV]. Frequent, WS; infrequent, PD, ES.

Carex michauxiana Boeckeler
Andre Michaux's Sedge *Rostrales (Folliculatae)*
(BR, F, GC, KM)



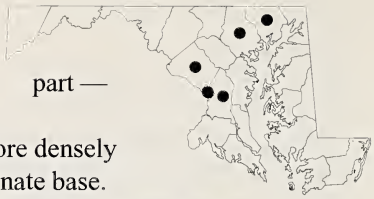
Similar to *C. folliculata* and *C. lonchocarpa*, but leaves narrower (1.5-4 mm wide); terminal (staminate) spike shorter (0.6-1.5 cm long); inflorescence bract sheaths concave, rather than prolonged, at the mouth. See Wujek and Menapace (1986). Seepage with *Sphagnum*. [none]. Rare (single station), AP. Disjunct from northeastern United States.

Carex mitchelliana M. A. Curtis
Mitchell's Sedge *Phacocystis*
(Cryptocarpae)
(F, GC, KM, RB, T; *C. crinita* Lamarck, in part — H; *C. crinita* var. *mitchelliana* (M.A. Curtis) Gleason)



Similar to, but smaller overall than, *C. gynandra* and varieties of *C. crinita*. Perigynium barely inflated, ellipsoid, densely granular-papillose throughout, with fairly distinct nerves. See Bruederle and Fairbrothers (1986), Bruederle et al. (1989). Floodplains; mature swamp forests. [DE, PA, VA]. Rare, ES.

Carex molesta Mackenzie *ex* Bright
Troublesome Sedge *Ovales*
(BR, F, KM, RB, SC; *C. brevior* (Dewey) Mackenzie, in part — GC)



Similar to *C. brevior*; the spikes more crowded and more densely flowered, the terminal often lacking a prolonged staminate base. Perigynia spreading at maturity, the bodies ovate and nerved on adazial side, 2.0-3.0 mm wide. See Rothrock and Reznicek (2001). Dry to moist fields and other open areas. [DE-h, PA, VA, WV]. Rare, PD-h, WS.

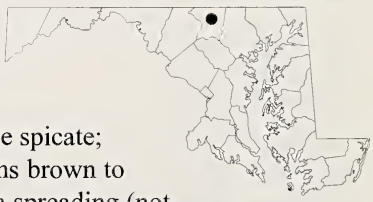
Carex muhlenbergii Schkuhr *ex* Willdenow var. ***enervis*** W. Boott
Muhlenberg's Sedge *Phaestoglochin (Bracteosae)*
(F, T; in part — GC; infraspecific taxa not distinguished — BR, H, HS, RB, SC; *C. muehlenbergii* var. *enervis*, an orthographic variant – KM; *C. plana* Mackenzie)

Similar to var. *muhlenbergii*, but with perigynium nerveless or with short basal nerves adaxially. Dry forests and edges, usually on more basic soils than var. *muhlenbergii*. [DE, VA]. Frequent, PD; infrequent, RV-h; rare, WS, ES.

Carex muhlenbergii Schkuhr *ex* Willdenow var. ***muhlenbergii***
Muhlenberg's Sedge *Phaestoglochin (Bracteosae)*
(F, T; in part only — GC; infraspecific taxa not distinguished — BR, H, HS, RB, SC; *C. muehlenbergii* var. *muehlenbergii*, an orthographic variant — KM)

Inflorescence spicate, as in *C. aggregata*, but leaf sheets tight and not septate-nodulose; pistillate scales as long as the perigynia and rough-awned; perigynium body orbicular to ovate and strongly nerved on both surfaces. Dry (most often acidic) forests and edges. [DE, PA, VA, WV-h]. Frequent, WS, ES; rare, RV, PD.

Carex muricata Linnaeus
Paira's Sedge *Phaestoglochin (Bracteosae)*
(GC, KM, RB; *C. pairaei* F. W. Schultz — BR, F)



Similar to *C. spicata* and *C. divulsa*, with inflorescence spicate; pistillate scales brown to blackish brown. Basal sheaths brown to blackish, not purple-tinged, as in *C. spicata*. Perigynia spreading (not appressed-ascending, as in *C. divulsa*), rounded at base and rather abruptly beaked. See Jermy et al. (1982). Roadside. [PA]. Locally adventive (European) (single collection), PD-h.

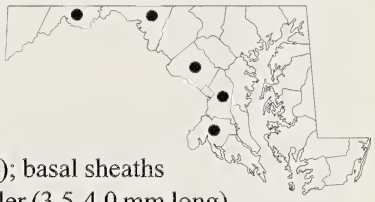
Carex nigromarginata Schweinitz
Black-margined Sedge *Acrocystis (Montanae)*
(BR, F, GC, H, HS, KM, RB, SC, T)

Distinctive sedge, with culms of various lengths that are shorter than the rigid, dark green leaves. Pistillate scales purple to brown-margined, obscuring the perigynia, which have fusiform-obovoid to ellipsoid, pubescent bodies. See Rettig (1990a). Dry forests; openings; barrens. [DE, PA, VA, WV]. Common, WS, ES, PD; frequent, RV.

Carex normalis Mackenzie
Greater Straw Sedge *Ovales*
(BR, F, GC, H, KM, RB, SC, T)

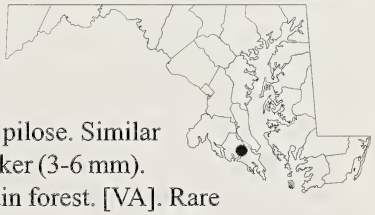
Variable. Culms leafy. Sterile shoots usually numerous. Spikes somewhat congested to remote, with perigynia beaks somewhat spreading. Similar to *C. festucacea*, but with ventral band of leaf sheath prolonged at summit; perigynium body narrowly ovate. Moist forests, fields, and meadows; floodplains. [DE, PA, WV, VA]. Common, AP; frequent, RV, PD; rare, ES (disjunct).

Carex oligocarpa Schkuhr *ex* Willdenow
Few-fruited Sedge *Griseae*
(Oligocarpae)
(BR, F, GC, H, HS, KM, RB, SC, T)



Similar to *C. hitchcockiana*. Leaves narrower (2-4 mm); basal sheaths purplish; upper leaf sheaths glabrous; perigynium smaller (3.5-4.0 mm long). Very similar to *C. planispicata*, but longest lateral (pistillate) spikes with fewer (4-8) perigynia; mature perigynium distinctly beaked, with more globose body. See Naczi (1999). Mesic forests, usually on basic soils. [DE-h, PA, VA, WV]. Infrequent, RV; rare, PD, WS.

Carex oxylepis Torrey and Hooker var. ***oxylepis***
Sharpscale Sedge *Hymenochlaenae (Gracillimae)*
(F, GC, H, KM)



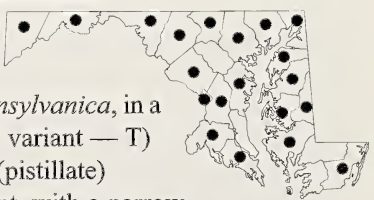
Similar to *C. gracillima*, but sheaths and, often, leaves pilose. Similar to *C. aestivalis*, but leaves wider (3-10 mm); spikes thicker (3-6 mm). Perigynium sharply angled and short-beaked. Floodplain forest. [VA]. Rare (single station), WS.

Carex pallescens Linnaeus
Pale Sedge *Porocystis (Virescentes)*
(GC, H, HS, KM, RB; *C. pallescens* Linnaeus var. *neogaea* Fernald — F)
The only member of section with terminal spike entirely staminate. Leaves pilose; perigynium glabrous and beakless. Moist fields and meadows. [PA, VA]. Rare, PD-h, WS-h. Disjunct from farther north.

Carex pedunculata Muhlenberg *ex* Willdenow
Long-stalked Sedge *Clandestinae (Digitatae)*
(BR, F, GC, H, KM, RB, SC, T)
Distinctive sedge with terminal spike androgynous and lateral spikes pistillate and long-peduncled from green, spathe-like sheaths. Perigynium with a basal eliasome. Pistillate scales conspicuously and abruptly cuspidate and purple-brown with hyaline margins. Calcareous, mesic soils. [DE-h, PA, VA, WV]. Rare, AP, RV.

Carex pellita Muhlenberg *ex* Willdenow
Woolly Sedge *Paludosae (Hirtae)*
(GC, KM, RB; *C. lanuginosa* Michaux, misapplied — BR, F, HS, SC, T; *C. lasiocarpa* Ehrhart, in part — H)
Strongly rhizomatous, with pubescent perigynia. Resembles *C. lasiocarpa*, but leaves wider (1.5-5.0 mm) and flat. Perigynium beak firm with teeth 0.3-0.8 mm long. See McClintock and Waterway (1994). Rich fens; wet meadows; ditches; pastures. [DE, PA, VA, WV]. Infrequent, PD; rare, AP, RV, WS, ES.

Carex pensylvanica Lamarck
Pennsylvania Sedge *Acrocystis (Montanae)*
(BR, GC, H, HS, KM, RB, SC; *C. pensylvanica* var. *pensylvanica*, in a narrow sense — F; *C. pennsylvanica*, an orthographic variant — T)
Colonial by rhizomes. Leaves narrow (1-3 mm); lateral (pistillate) spikes sessile; perigynium body globose and pubescent, with a narrow, short (0.2-0.9 mm) beak that is one-fifth to one-fourth as long as the body. See Crins and Ball (1983). Dry to mesic forests. [DE, PA, VA, WV]. Common, RV, PD, WS, ES; frequent, AP.



Carex planispicata Naczi
Flat-spiked Sedge *Griseae (Oligocarpae)*
(RB; *C. amphibola* Steudel var. *amphibola*, misapplied — F, KM; *C. amphibola* Steudel var. *rigida* Fernald, in part — BR, T; *C. amphibola* Steudel, in part — GC, H, HS, SC)

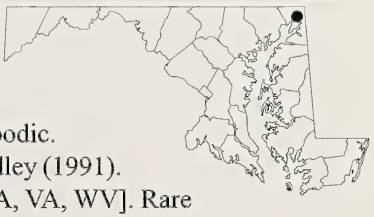
Similar to *C. amphibola*, but shoot bases purple; perigynia distichously arranged. Very similar to *C. oligocarpa*, but longest lateral (pistillate) spikes with more (7-14) perigynia; perigynium beakless, trigonous. See Naczi (1999). Rich, dry to mesic forests, often on mafic soils. [DE, PA, VA, WV]. Rare, PD.

Carex plantaginea Lamarck
Plantain-leaved Sedge *Careyanae (Laxiflorae)*
(BR, F, GC, H, KM, RB, SC)

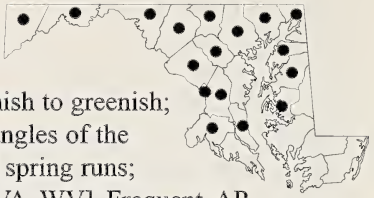
Distinctive, with purple base and wide (10-30 mm) leaves with prominent parallel veins. Fertile culms leafless, with bladeless purple sheaths. Perigynium sharply 3-angled. Staminate scales purple. See Manhart (1986). Rich hardwood forests. [PA, VA, WV]. Rare, AP, PD-h; Piedmont plants are locally adventive (from Appalachian region) or planted.

Carex platyphylla Carey
Broad-leaved Sedge *Careyanae (Laxiflorae)*
(BR, F, GC, H, HS, KM, RB, SC, T)

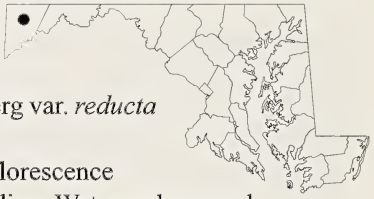
Leaves wide (12-30 mm), as with *C. albursina* and *C. plantaginea*, but strongly glaucous. Basal sheaths whitish. Fertile culms unwinged, leafy; perigynium sharply trigonous. See Manhart (1986). Rich forests, often on calcareous or mafic soils. [PA, VA, WV]. Frequent, RV, PD; rare, WS.

Carex polymorpha Muhlenberg
Variable Sedge *Paniceae*
(BR, F, GC, H, KM, RB, SC, T)

Colonial sedge with hard and stout rhizomes; aphyllopodic. Perigynium with elongated beak. See Standley and Dudley (1991). Open, sandy forests and woodlands; barrens. [DE-h, PA, VA, WV]. Rare (single collection), PD-h.

Carex prasina Wahlenberg
Drooping Sedge *Hymenochlaenae (Gracillimae)*
(BR, F, GC, H, HS, KM, RB, SC, T)
Similar to *C. gracillima*, but with basal sheaths brownish to greenish; perigynium strongly trigonous, with nerves over the angles of the achene. Seepage swamps; edges of small streams and spring runs; occasionally on floodplains; in mucky soils. [DE, PA, VA, WV]. Frequent, AP, RV, PD; infrequent, WS, ES.

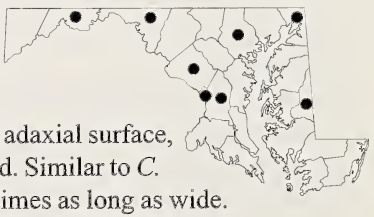


Carex projecta Mackenzie
Necklace Sedge *Ovales*
(BR, F, GC, HS, KM, RB, SC; *C. tribuloides* Wahlenberg var. *reducta* Bailey; *C. tribuloides*, in part — H)
Much like *C. tribuloides*; spikes generally smaller; inflorescence moniliform; perigynia tips spreading or loosely ascending. Wet meadows and fens, at high elevations. [PA, WV, VA]. Infrequent, AP. Reported from PD (e.g., Hitchcock and Standley (1919)), but all such plants seen have proven to be *C. tribuloides*.

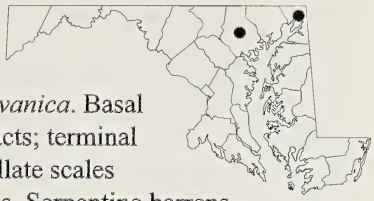


Carex radiata (Wahlenberg) Small
Eastern Star Sedge *Phaestoglochin (Bracteosae)*
(GC, KM, RB; *C. rosea* Schkuhr, misapplied — BR, F, HS, SC, T; *C. rosea*, in part, misapplied — H)
Similar to *C. rosea*, *C. appalachica*. Leaves 0.9-1.7 mm wide. Perigynia usually 3-7 per spike, the lowest reflexed at maturity. Stigmas straight to slightly twisted. Base of achene 0.5-0.9 mm from perigynium base. See Webber and Ball (1979, 1984). Moist to mesic forests; edges. [DE, PA, VA, WV]. Common, RV, PD, WS; frequent (rare southward), ES.

Carex retroflexa Muhlenberg *ex* Schkuhr
Reflexed Sedge *Phaestoglochin (Bracteosae)*
(BR, F, GC, KM, H, HS, RB, SC, T)
Similar to *C. rosea*, but base of perigynium bulging on adaxial surface, distinctly nerved; beak of perigynium smooth-margined. Similar to *C. texensis*, but with perigynium shorter-beaked, 2.0-2.5 times as long as wide. Dry, rich forests. [DE, PA, VA, WV]. Infrequent, RV, PD; rare, WS-h, ES.



Carex richardsonii R. Brown
Richardson's Sedge *Clandestinae (Digitatae)*
(F, GC, KM, RB)

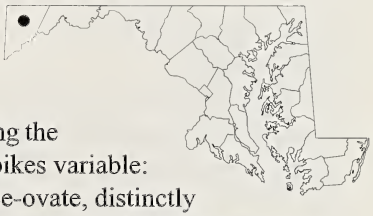


Rhizomatous sedge superficially resembling *C. pensylvanica*. Basal leaves thick and stiff; spikes with purple sheathing bracts; terminal spike staminate, purplish. Perigynium pubescent. Pistillate scales obtuse to acute and purple-brown with hyaline margins. Serpentine barrens. [PA]. Rare, PD.

Carex rosea Schkuhr *ex* Willdenow
Rose Sedge *Phaestoglochin (Bracteosae)*
(GC, KM, RB; in part only — H; *C. convoluta* Mackenzie — BR, F, SC, T; in part — HS)

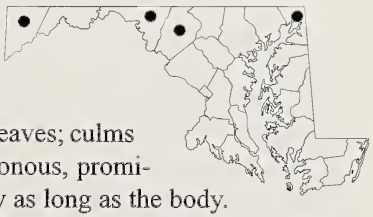
Similar to *C. radiata* and *C. appalachica*. Leaves 1.7-3.0 mm wide. Perigynia 7-14 per spike, the lower reflexed at maturity. Stigmas tightly coiled. Achene set low in perigynium, with base 0.1-0.5 mm from perigynium base. See Webber and Ball (1979, 1984). Upland forests. [DE, PA, VA, WV]. Frequent, AP, RV, PD; infrequent, WS, ES (rare southward).

Carex sartwellii Dewey
Sartwell's Sedge *Holarrhenae (Intermediae)*
(BR, F, GC, KM, RB)



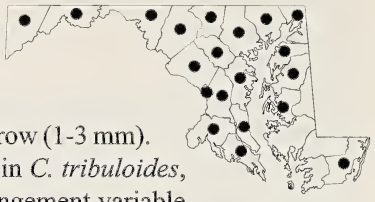
Rhizomes thick, black, scaly. Culms scabrous, exceeding the scabrous leaves. Inflorescence narrowly cylindrical; spikes variable: staminate, pistillate, or androgynous. Perigynium lance-ovate, distinctly nerved, with serrulate, bidentate beak. Calcareous wet meadows. [PA-h]. Rare (single collection), AP-h. Disjunct from further north.

Carex scabrata Schweinitz
Eastern Rough Sedge *Anomalae*
(BR, F, GC, H, KM, RB, SC, T)



Rhizomatous sedge with wide (0.6-1.8 mm), scabrous leaves; culms scabrous. Perigynium scabrous-puberulent, ovoid-trigonous, prominently few-nerved, with an abrupt, distinct beak nearly as long as the body. Banks of small to medium-sized streams; seepages. [DE, PA, VA, WV]. Frequent, AP; rare, RV, PD.

Carex scoparia Schkuhr *ex* Willdenow var. ***scoparia***
Pointed Broom Sedge *Ovales*
(KM; infraspecific taxa not distinguished — BR, F, GC, H, HS, RB, SC, T)

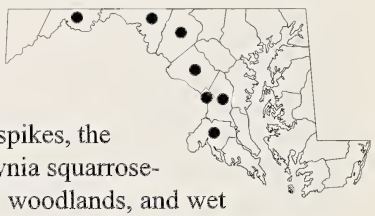


Similar to *C. tribuloides*, but leaves generally more narrow (1-3 mm). Perigynia tightly ascending and thin and scale-like as in *C. tribuloides*, but with wings continuous to base. Inflorescence arrangement variable. Moist, or (occasionally) dry, open areas. [DE, PA, WV, VA]. Common, AP; frequent, RV, PD, WS; infrequent, ES.

Carex seorsa Howe
Weak Stellate Sedge *Stellulatae*
(BR, F, GC, H, KM, RB, T; *C. rosaeoides* Howe — HS)

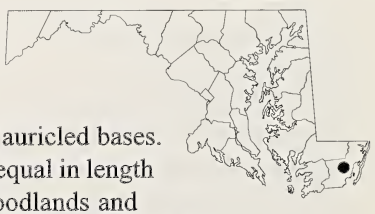
Distinguished from other members of section, by the elliptic-ovate perigynium body that is broadest near the middle and by the short, smooth-margined perigynium beak. See Reznicek and Ball (1980). Swamp forests; seepages; floodplains. [DE, PA, VA, WV]. Common, ES; frequent, WS; rare, AP (disjunct), PD-h.

Carex shortiana Dewey
Short's Sedge *Shortianae*
(BR, F, GC, H, HS, KM, RB, SC)

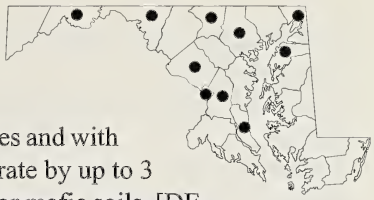


Distinctive sedge, with densely flowered, cylindrical spikes, the terminal gynecandrous and the lateral pistillate. Perigynia squarrose-obovoid and brownish at maturity. Rich, open forests, woodlands, and wet meadows on floodplains. [PA, VA, WV]. Infrequent, RV; rare, PD, WS-h. Mostly along Potomac River.

Carex silicea Olney
Seabeach Sedge *Ovales*
(BR, F, GC, H, KM, T)



Distinctive within section. Leaves grayish-green with auricled bases. Inflorescence moniliform, nodding. Tips of perigynia equal in length to or exceeded by subtending scales. Open, sandy woodlands and shrublands of barrier islands. [DE, VA]. Rare (locally frequent), coastal, ES.



Carex sparganioides Muhlenberg *ex* Willdenow
Bur-reed Sedge *Phaestoglochin (Bracteosae)*
(BR, F, HS, KM, RB, SC, T; in part only — H; *C. sparganioides* var. *sparganioides* — GC)
Similar to *C. aggregata*, but with wider (5-10 mm) leaves and with inflorescence elongate with lower spikes remote (separate by up to 3 cm). Rich forests and meadows, usually on calcareous or mafic soils. [DE, PA, VA, WV-h]. Rare, RV, PD, WS, ES.

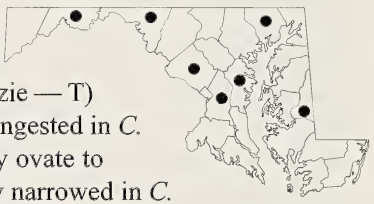
Carex spicata Hudson
Prickly Sedge *Phaestoglochin (Bracteosae)*
(BR, F, GC, H, KM, RB, T; *C. muricata* Linnaeus, misapplied — HS; *C. contigua* Hoppe)
Inflorescence spicate; pistillate scales often strongly tinged with brown or reddish purple. Similar to *C. divulsa* and *C. muricata,* but basal sheaths purplish (not brown to blackish); ligule prolonged, much longer than broad; perigynium larger (4-6 mm long). See Jermy et al. (1982). Fields; other open, disturbed sites. [DE, PA]. Locally naturalized or adventive (European), PD, WS-h.

Carex squarrosa Linnaeus
Squarrose Sedge *Squarrosae*
(BR, F, GC, H, HS, KM, RB, SC, T)
Perigynia abruptly beaked, with obovoid bodies, and densely packed. Terminal spike gynecandrous, as in *C. typhina*, but spikes subglobose; perigynia beaks widely divergent, the lower reflexed; style strongly contorted at base. Moist fields, meadows, and forests; floodplains. [DE, PA, VA, WV]. Frequent, RV, PD, WS; rare, ES.

Carex stipata Muhlenber *ex* Willdenow var. ***maxima*** Chapman
Greater Stalkgrain Sedge *Vulpinae*
(F, GC, KM, RB, SC, T; infraspecific taxa not distinguished — BR, H, HS; *C. uberior* (Mohr) Mackenzie)
Stouter and with leaves wider (8-17 mm) than var. *stipata*; perigynium longer (5-6 mm), with beak longer (> 3 mm), as long as or longer than the body. Swamps; floodplain forests; fresh tidal marshes. [DE, PA, VA, WV]. Frequent, WS, ES; rare, PD.

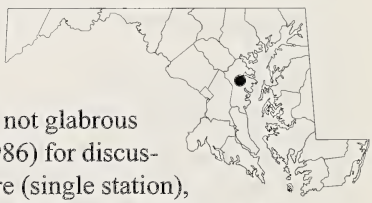
Carex stipata Muhlenberg *ex* Willdenow var. ***stipata***
Stalkgrain Sedge *Vulpinae*
(F, GC, KM, RB, SC, T; infraspecific taxa not distinguished — BR, H, HS)
Similar to *C. laevivaginata*, but inner band of leaf sheaths friable, cross-puckered. Similar to var. *maxima*; leaves narrower (4-10 mm); perigynium shorter (4-5 mm), the beak shorter (under 2.5 mm). Swamps; wet meadows; fens; floodplain forests. [DE, PA, VA, WV]. Frequent, AP, RV, PD; infrequent, WS; rare, ES.

Carex straminea Willdenow *ex* Schkuhr
Eastern Straw Sedge *Ovales*
(BR, F, GC, KM, RB, SC; in part only — H; *C. hormathodes* Fernald, in part — HS; *C. richii* Mackenzie — T)
Pistillate scales awn-tipped. Spikes well-separated (congested in *C. alata*); inflorescence often nodding . Perigynium body ovate to suborbicular, abruptly narrowed to beak (continuously narrowed in *C. hormathodes*). See Rothrock et al. (1997). Seasonally dry pools; swamps; other non-tidal wetlands. [DE, PA, VA, WV]. Rare, RV, PD, WS, ES.

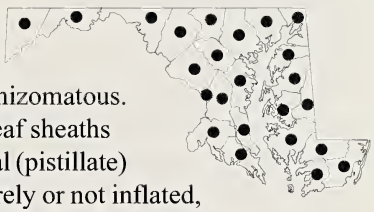


Carex striata Michaux var. ***brevis*** Bailey
Walter's Sedge *Paludosae (Hirtae)*
(GC, KM; infraspecific taxa not distinguished — H; *C. walteriana* Bailey var. *brevis* (Bailey) Bailey — F; *C. walteriana* Bailey — T)
Rhizomatous. Similar to *C. pellita*, perigynia glabrous and with impressed nerves. See Reznicek and Catling (1986) for discussion of nomenclature. Delmarva Bays; ditches; other open, often disturbed wetlands. [DE, VA]. Frequent (rarer northward), ES.

Carex striata Michaux var. ***striata***
Pocosin Sedge *Paludosae (Hirtae)*
(GC, KM; *C. walteriana* Bailey var. *walteriana* — F)
Similar to var. *brevis*, but with perigynium puberulent, not glabrous (pubescent in *C. pellita*). See Reznicek and Catling (1986) for discussion of nomenclature. Coastal Plain "bog." [none]. Rare (single station), WS. Although the range of var. *striata* has been said to be limited to areas well to the south of Maryland (Fernald 1950; Gleason and Cronquist 1991), forms with puberulent perigynia actually occur sparingly north to New Jersey (A. A.Reznicek, pers. comm.)



Carex striatula Michaux
Lined Sedge *Laxiflorae*
(BR, F, GC, HS, KM, RB, SC, T; in part only — H)
Very similar to and possibly not taxonomically distinct from, *C. laxiflora* (see Manhart, 1986). Terminal (staminate) spike on longer peduncle (more than 20 mm); lateral (pistillate) spikes thicker (4-8 mm), perigynium longer (4.0-5.5 mm), fusiform, rather than obovoid. Dry to mesic forests. [DE, PA, VA, WV]. Infrequent, RV, PD, ES; rare, WS.



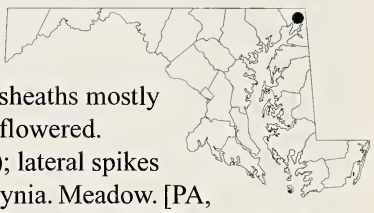
Carex stricta Lamarck
Tussock Sedge *Phacocystis (Acutae)*
(BR, F, GC, H, HS, KM, RB, SC, T)
Form somewhat variable; densely cespitose to freely rhizomatous. Similar to *C. emoryi* and *C. haydenii*, but with lower leaf sheaths fibrillose. Summit of leaf sheaths concave. Lower lateral (pistillate) spikes usually remote. Perigynium ovate to elliptic, barely or not inflated, granular-papillose above the middle. See Standley (1989). Fens; wet meadows; swamps; alluvial forests. [DE, PA, VA, WV]. Common, AP, WS, ES; frequent, RV, PD.

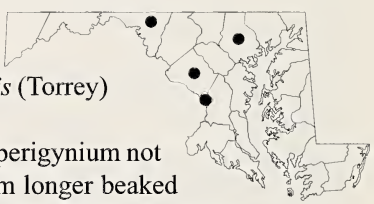
Carex styloflexa Buckley
Bent Sedge *Laxiflorae*
(BR, F, GC, HS, KM, RB, T; included in *C. striatula* Michaux — H)
Fairly distinctive within section. Basal sheaths brownish-whitish. Terminal (staminate) spikes long-peduncled. Lateral (pistillate) spikes densely few-flowered and remote, the lowest on elongate, filiform peduncles. Perigynium beak arching. See Manhart (1986). Moist forests; tidal swamps; seepages. [DE, PA, VA, WV]. Frequent, WS, ES; infrequent, PD; rare, RV.

Carex swanii (Fernald) Mackenzie
Swan's Sedge *Porocystis (Virescentes)*
(BR, F, GC, H, HS, KM, RB, SC, T)
Leaves and perigynia pubescent, as with *C. virescens*, but spikes subglobose to thick-cylindrical, 0.5-1.8 cm long; perigynium less strongly nerved; anthers smaller (0.7-1.6 mm). Dry to mesic forests and fields. [DE, PA, VA, WV]. Common, PD, WS, ES; frequent, AP, RV.

Carex tenera Dewey
Slender Sedge *Ovales*
(BR, F, GC, H, KM, RB, SC)

Other taxa in this section are sometimes misidentified as this species in collections. Perigynium body ovate, as in *C. normalis*, but leaves narrower (1.0-2.5 mm); entire inflorescence moniliform and nodding. Floodplain forests. [PA, VA, WV]. Rare, PD, WS-h.

Carex tetanica Schkuhr
Rigid Sedge *Paniceae*
(BR, F, GC, H, KM, RB, T; in part only — HS)

Rhizomatous and similar to *C. woodii*, but with basal sheaths mostly bearing blades; lateral (pistillate) spikes more densely flowered. Similar to *C. meadii*, but leaves green (not gray-green); lateral spikes narrower (3-5 mm), with only 2-3 vertical rows of perigynia. Meadow. [PA, VA, WV]. Rare (single collection), PD-h. Reports from DC area (e.g., Hitchcock and Standley (1919)) are evidently based on *C. woodii* or on misidentifications.

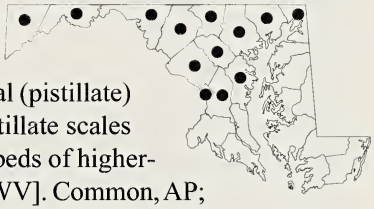
Carex texensis (Torrey) Bailey
Texas Sedge *Phaestoglochin (Bracteosae)*
(BR, F, KM, RB; *C. retroflexa* Muhlenberg var. *texensis* (Torrey) Fernald — GC)

Similar to *C. retroflexa*, but base of adaxial surface of perigynium not bulging and nerveless to obscurely nerved; perigynium longer beaked and relatively more narrow (about 3 times as long as wide). Dry forests and fields; disturbed areas. [DE, PA, VA, WV]. Locally naturalized or adventive (from southern United States), RV-h, PD.

Carex tonsa (Fernald) Bicknell var. ***rugosperma*** (Mackenzie) Crins
Rough-seeded Sedge *Acrocystis (Montanae)*
(RB; *C. rugosperma* Mackenzie — KM, T; *C. umbellata* Schkuhr, misapplied — F; in part — BR, GC, H, SC)

Similar to *C. umbellata*, but perigynium beak as long as the body. Similar to var. *tonsa*, but leaves narrower (1.5-3.0 mm); perigynium membranaceous, minutely pubescent. See Cusick (1992), Rettig and Crins (1996). Dry forests; rocky openings. [PA, VA, WV]. Frequent, AP; infrequent, RV; rare, PD.

Carex tonsa (Fernald) Bicknell var. ***tonsa***
Shaved Sedge *Acrocystis (Montanae)*
(RB; *C. tonsa*, in a narrow sense — BR, F, KM, T; in part only — HS; *C. umbellata* Schkuhr, in part — GC, H, SC; *C. rugosperma* Mackenzie var. *tonsa* (Fernald) Voss, misapplied)

Similar to var. *rugosperma*, but with short, rigid, wider (2.0-4.5 mm) leaves; perigynia glabrous and shining. See Cusick (1992), Rettig and Crins (1996). Dry, often sandy, forests and openings; rock outcrops. [DE, PA, VA, WV]. Common, ES; frequent, RV, PD, WS; rare, AP.

Carex torta F. Boott *ex* Tuckerman
Twisted Sedge *Phacocystis (Cryptocarpae)*
(BR, F, GC, H, HS, KM, RB, SC, T)

Short-rhizomatous sedge in dense clumps. Lower lateral (pistillate) spikes drooping; perigynium beak bent or twisted; pistillate scales dark brown with green midrib. Along banks of and in beds of higher-gradient small to medium-sized streams. [DE, PA, VA, WV]. Common, AP; frequent, RV; infrequent, PD; rare, WS.

Carex tribuloides Wahlenberg var. ***tribuloides***
Blunt Broom Sedge *Ovales*
(KM; infraspecific taxa not distinguished — BR, F, GC, HS, RB, SC, T; *C. tribuloides*, in part only — H)

Spikes mostly crowded. Perigynia thin and scale-like, with strongly ascending tips, as in *C. scoparia*, but with wings abruptly narrowed at the base. Some Maryland plants may be var. *sangemonensis* Clokey. Moist forests and open areas, floodplains. [DE, PA, VA, WV]. Common, RV, PD; frequent, WS, ES; infrequent, AP.

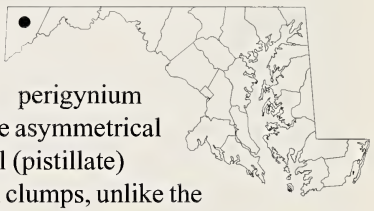
Carex trichocarpa Muhlenberg *ex* Schkuhr
Hairy-fruited Sedge *Carex (Paludosae)*
(H; RB; *C. trichocarpa* Muhlenberg — BR, F, GC, KM, SC, T)

Rhizomatous sedge; outwardly similar to *C. lacustris*, but with pubescent perigynia, with teeth up to 2.7 mm long. Summit of inner bands of leaf sheaths concave and purple-tinged. Wet meadows; open stream banks. [DE, PA, VA, WV]. Rare, PD.

Carex trisperma Dewey var. ***trisperma***
Three-seeded Sedge *Glareosae (Heleonastes)*
(GC, KM; infraspecific taxa not distinguished — BR, F, H, RB, SC, T)

Distinctive sedge with narrow-leaves (1-2 mm) and weak, filiform, decumbent culms. Similar to *C. brunnescens*, but with lowest inflorescence bract long-linear, much exceeding the spikes, which are few-flowered (1-5). Fens; seepages; usually on *Sphagnum*. [DE-h, PA, VA, WV]. Frequent, AP.

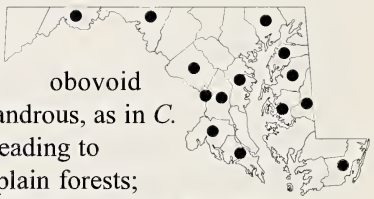
Carex tuckermanii F. Boott *ex* Dewey
Tuckerman's Sedge *Vesicariae*
(F, GC, KM, RB)



Most similar to *C. bullata* and *C. vesicaria*, but with perigynium wider (more than 4.5 mm) and of papery texture; achene asymmetrical and deeply indented in the middle of one angle. Lateral (pistillate) spikes wider (1.2-1.8 cm) than in *C. vescaria*. Grows in clumps, unlike the rhizomatous *C. bullata*. Floodplains; fens. [PA, WV]. Rare, AP.

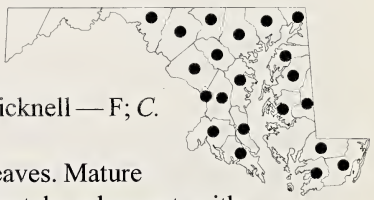
Carex typhina Michaux

Cattail Sedge *Squarrosae*
(BR, F, GC, H, HS, KM, RB, SC, T)



Distinctive sedge. Perigynia abruptly beaked, with obovoid bodies, and densely packed and terminal spike gynecandrous, as in *C. squarrosa*, but spikes cylindrical; perigynia beaks spreading to ascending; style straight or curved at the base. Floodplain forests; forested vernal pools. [DE, PA, VA, WV]. Infrequent (locally common), WS, ES; rare, RV, PD.

Carex umbellata Schkuhr *ex* Willdenow
Umbellate Sedge *Acrocystis (Montanae)*
(KM, RB, T; in part only — BR, GC, H, SC; *C. abdita* Bicknell — F; *C. tonsa* (Fernald) Bicknell, in part — HS)

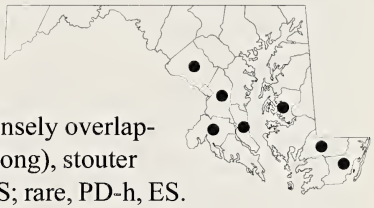


Densely cespitose sedge, with narrow (1-3 mm wide) leaves. Mature spikes nearly hidden among leaf bases. Perigynium minutely pubescent, with the beak half as long as the body. See Cusick (1992), Rettig and Crins (1996). Dry forests and openings. [DE, PA, VA, WV]. Common, PD, WS, ES; infrequent, RV.

Carex utriculata F. Boott
Northwest Territory Sedge *Vesicariae*
(GC, KM, RB; *C. rostrata* Stokes, in a broad sense — H, HS; *C. rostrata* Stokes var. *utriculata* (F. Boott) Bailey — BR, F, SC; *C. inflata* Hudson var. *utriculata* (F. Boott) Druce — T)

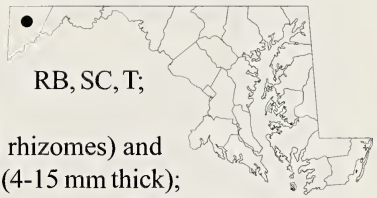
Rhizomatous, forming large colonies. Leaves and sheaths septate-nodulose. Perigynia strongly nerved, spreading, densely crowded, mostly in 8 or more vertical rows. Fens; fresh tidal marsh. [DE-h, PA, VA,WV]. Infrequent, AP; rare, RV, WS-h (disjunct).

Carex venusta Dewey var. ***minor*** Boeckeler
Dark Green Sedge *Hymenochlaenae (Sylvaticae)*
(BR, F, GC, KM; infraspecific taxa not distinguished — H; *C. oblita* Steudel — HS, T)



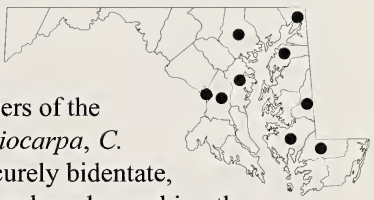
Similar to *C. debilis* var. *debilis*, but perigynia more densely overlapping, more strongly nerved, and with shorter (0.5 mm long), stouter beaks. Mesic to moist forests. [DE, VA]. Infrequent, WS; rare, PD-h, ES.

Carex vesicaria L. var. ***monile*** (Tuckerman) Fernald
Inflated Sedge *Vesicariae*
(F, KM; infraspecific taxa not distinguished — BR, H, RB, SC, T; *C. vesicaria* L. var. *vesicaria*, in a broad sense — GC)



Similar to *C. bullata*, but cespitose (without elongated rhizomes) and with lateral (pistillate) spikes more narrowly cylindrical (4-15 mm thick); perigynium beak smooth; distribution primarily montane. Wet meadow. [DE, PA, VA (possibly var. *vesicaria*), WV]. Rare (single station), AP.

Carex vestita Willdenow
Velvety Sedge *Paludosae (Hirtae)*
(BR, F, GC, H, HS, KM, RB, T)

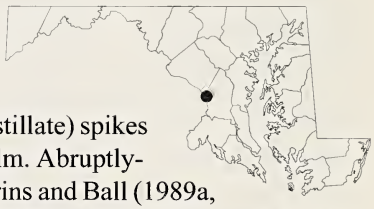


Strongly rhizomatous. Distinguished from other members of the section that also have the perigynia pubescent (*C. lasiocarpa*, *C. pellita*), primarily by having the perigynium beak obscurely bidentate, with soft teeth; lowermost inflorescence bract shorter and rarely reaching the terminal (staminate) spike, which is on a relatively shorter peduncle. Open, sandy wetlands. [DE, PA, VA]. Infrequent ES; rare, WS.

Carex virescens Muhlenberg *ex* Willdenow
Ribbed Sedge *Porocystis (Virescentes)*

(BR, F, GC, H, HS, KM, RB, SC, T)
Leaves and perigynia pubescent, as in *C. swanii*, but with spikes linear-cylindrical, 1.5-4.0 cm long; nerves of perigynium more pronounced, often whitened; anthers larger (1.5-2.5 mm). Dry forests. [DE, PA, VA, WV]. Common, RV, PD, WS; frequent, AP; rare, ES.

Carex viridula Michaux
Little Green Sedge *Spirostachyae*
(Ceratocystis)



(F, GC, KM, RB; *C. oederi* Retz, misapplied — HS)
Terminal spike staminate or pistillate at tip. Lateral (pistillate) spikes ovoid to short-cylindrical, crowded near summit of culm. Abruptly-beaked perigynia spreading to slightly reflexed. See Crins and Ball (1989a, 1989b). Wet, often calcareous, soil; shores; springs. [PA]. Rare (single collection), PD-h or WS-h. Specimen reported by Hitchcock and Standley (1919) not found.

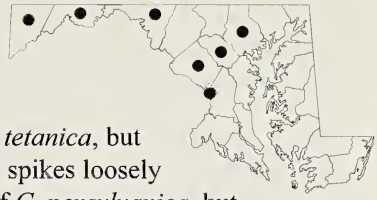
Carex vulpinoidea Michaux
Fox Sedge *Multiflorae*

(BR, F, GC, HS, RB, SC, T; in part only — H; *C. vulpinoidea* var. *vulpinoidea* — KM)
Similar to *C. annectens*, but with mature culms generally exceeded by the leaves; lowermost inflorescence bract longer (often more than 5 cm); perigynium beak about as long as body. Moist to wet, open (often disturbed) habitats. [DE, PA, VA, WV]. Common throughout.

Carex willdenowii Schkuhr *ex* Willdenow
Willdenow's Sedge *Phyllostachyae*

(BR, F, H, HS, SC, T; *C. willdenovii*, an orthographic variant — GC, RB; *C. willdenowii* var. *willdenowii*, in a narrow sense — KM)
Staminate scales tightly clasping, as in *C. jamesii*, but perigynium body ellipsoid-fusiform, more gradually tapered to a stout, serrate beak. See Catling et al. (1993), Naczi et al. (1998). Dry forests. [DE, PA, VA, WV]. Common, PD, WS; infrequent, RV; rare, AP-h.

Carex woodii Dewey
Wood's Sedge *Paniceae*
(BR, F, GC, H, KM, RB; *C. tetanica* Schkuhr var. *woodii* (Dewey) Bailey — HS)



Rhizomatous in colonies; bases purple. Resembles *C. tetanica*, but with basal sheaths mostly bladeless; lateral (pistillate) spikes loosely and alternately flowered. Colonies appear like those of *C. pensylvanica*, but leaves blue-green, lateral spikes peduncled. Dry to mesic, rich forests. [PA, VA, WV]. Frequent, RV; rare, AP, PD. Evidently overlooked in past.

Addendum—Records for the following two taxa were discovered after the manuscript went to press, but have been included here to maintain completeness of coverage. (Note: Text and figures modified to accomodate these.)

Carex caryophyllea Latourette
Spring Sedge *Mitratae (Praecoces)*
(BR, F, GC, KM)

Rhizomatous sedge with fibrillose bases and stiff, scabrous leaves. Terminal (staminate) spike scales red-brown. Lateral (pistillate) spikes sessile or nearly so. Perigynium hirsute, with short beak; pistllate scales red-brown and cuspidate; achene capped by a dark annulus with a central projecting apex. See Jermy et al. (1982). Cultivated area. [none]. Locally adventive (European) (single collection), WS-h.

Carex digitalis Willdenow var. ***asymmetrica*** Fernald
Large-fruited Slender Woodland Sedge
Careyanae (Laxiflorae)
(F; infraspecific taxa not distinguished — GC, H, KM).

Similar to var. *digitalis*, but perigynia longer (3.2-4.2 mm), with the apex excurved and the angles more obscure. See Naczi et al. (2001). Dry-mesic forest. [VA]. Rare (single station), WS. Some authors question its taxonomic distinctiveness (see Manhart, 1986).

Instructions to Authors

The Maryland Naturalist is a peer reviewed biannual publication of the Natural History Society of Maryland. *The Maryland Naturalist* seeks to publish original research concerning the natural history and ecology of Maryland and adjacent states. Two types of manuscripts are considered for publication: 1) full length contributions describing the results of original research, and 2) short communications reporting unusual natural history observations. Full-length manuscripts may deal with subject matter including, but not limited to, the geology, chemistry, and biology of the Maryland region. Short communications should describe unusual observations; for example, the occurrence of a rare organism or geological formation, or the occurrence of an organism or population that extends the known range of a species. *The Maryland Naturalist* will occasionally publish biographies of naturalists of regional significance. Individuals wishing to write a biography should write the editor at the following address: Department of Biological Sciences, Towson University, Towson, Maryland 21252; jsnodgrass@naturalhistory.org.

The original and three copies of all manuscripts should be submitted to *The Maryland Naturalist*, The Natural History Society of Maryland, 2643 North Charles Street, Baltimore, Maryland 21218-4590. Manuscripts should be typed on 8 ½" X 11" paper, double spaced throughout (including tables), with 1" margins on all sides, and all pages (including tables) should be numbered. Use metric units unless English measures are appropriate, in which case metric equivalents should be given in parentheses. A cover page with the title of the paper, addresses of all authors, and the name and complete address (including zip code and email) of the corresponding author should be included with the original manuscript and all copies.

Full-length contributions should have an abstract of no more than 300 words. Short communications should not have an abstract and should be limited to 2500 words. Avoid undue formatting of the manuscript. Limit italicized text to scientific names of species. Literature citations in the text should use the name-and-year system (e.g., one author-Smith 1980; two authors-Smith & Smith 1980; more than two authors Smith et al. 1980) with semicolons separating individual citations (e.g., Smith 1980; Jones et al. 1982), and the Literature Cited section should follow the main body of the manuscript. Consult a recent issue of the journal for formatting of the Literature Cited section. All tables should appear on separate pages following the literature cited, have brief headings, be double spaced, and not include vertical lines. All figures should be printed on separate pages and lettering should be uniform among figures. Photographs and hand-draw illustrations should be mounted on standard size paper or backing board and mailed flat. All figures should be clear and free of smudges and correction marks. Only black and white figures, illustrations and photographs will be published. Figures should be legible after 50-66% reduction. Figure legends should be typed on a separate page, double-spaced, and appear just before the figures. The author's name and figure number should be lightly penciled on the back of each figure.

In their cover letter authors should identify at least three potential reviewers with expertise in the subject matter of the manuscript and without close personal working ties with the author(s). The cover letter should also indicated that the manuscript has not

been published previously and is not being considered for publication elsewhere. Authors should indicate the intended manuscript category in their cover letter. Voluntary page charges will be assessed when authors have grant, institute, or other funds available. Ability to pay page charges will in no way influence whether or not a manuscript is accepted for publication. Do not include page charge information in your cover letter.

Upon manuscript acceptance, authors will be required to send an electronic version of their manuscript to the copy editor. In order of preference, word processing software is Microsoft Word and WordPerfect. Authors are encouraged to use these software packages in manuscript development to facility the publishing process. Authors of published articles are expected to transfer copyrights for the published material to the Natural History Society of Maryland. Prompt review of copyedited manuscripts and page proofs is the responsibility of the senior author. Reprint will be made available to the author(s) at printing costs.

Joel W. Snodgrass
Editor

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01371 7657